Integrating The Monorail

MISCELLANEOUS

DEIS Comments

City of Seattle Comments on the Seattle Monorail Green Line Draft Environmental Impact Statement

October 2003

City of Seattle

OVERVIEW

This Miscellaneous section of the City's comment letter includes technical corrections, errata, and detailed references for comments that are included in the other sections of the comment letter.

EXECUTIVE SUMMARY

Changes to the EIS text recommended elsewhere in the City's comments on the DEIS that would result in changes in the Executive Summary, especially the summary tables, should be reflected in the FEIS version of the Executive Summary.

TECHNICAL CORRECTIONS & ERRATA

General

It would be helpful in the document to give specific sections and/or pages within chapters when other chapters of the EIS are referenced.

The DEIS is organized by segment and route alternative within segment for Seattle Center. We understand that SMP defined interchangeable routing options in order to be complete in its coverage of potential impacts among the routes; we also understand that SMP needed to define geographic "route segments" to organize the comparative analyses. That said, the DEIS does not present a comparison of Seattle Center alignment alternatives that isolate the comparative quantifiable impacts of the route alternatives. The FEIS will more effectively aid decision making if it provides a comparative analysis of the impacts of the Seattle Center route alternatives. The FEIS should also more fully address impacts on Seattle Center facilities/properties be more definitive about SMP's responsibility for the cost of replacement facilities and or mitigation. The FEIS should provide a comparison that reflects the decision the City must make – namely, the specific differences in impact between routes as those routes differ in their service to Seattle Center. The FEIS should include a matrix of impacts comparing the routes that addresses (a) tree/landscape impacts; (b) business displacement impacts; (c) historic structure impacts; (d) capital and operating cost impacts; (e) impacts on/consistency with adopted Seattle Center and Neighborhood Plans; (f) construction impacts and mitigation; and, (g) on and off street parking loss.

Executive Summary

1-19 The last sentence at top of page 1-20 which reads "For more information, please see Section 4.9, Public Services and Utilities" should be moved to immediately follow the last sentence on page 1-19 as it is more applicable to the context of that sentence. A similar statement should be provided for the construction impacts that point the reader to Section 4-17 for that information.

Purpose & Need

2-1 Starting with the 3rd paragraph under Purpose and Need. This section describing the City's Intermediate Capacity Transit Study is inaccurate. The Study was conducted primarily to address mobility and the lack of transportation choices for Seattle residents, to improve transit's dependability, and improve Seattle neighborhoods' livability. The Study was not specifically designed because of the worsening traffic congestion.

2-2 4th Paragraph: Replace inaccurate text with following: "The City of Seattle, its partner agencies and consultant team, examined the feasibility of intermediate capacity transit starting in

June 2000. ICT technologies included bus rapid transit, streetcars and trams, and elevated transit. The Study, which was conducted in partnership with Sound Transit, King County Metro, Washington State Department of Transportation (WSDOT), and the ETC, was based on the following findings about Seattle's transportation needs:"

2-2 The three bullets should be replaced with the following text. – "Intermediate capacity transit service would link Seattle neighborhoods, especially farther-out neighborhoods, to the regional transportation system and to link Seattle neighborhoods to each other.
--Sound Transit's planned Light Rail project would provide needed regional transit service. However, many travel markets would remain underserved. There are significant north/south and east/west transit routes that require fixed guideway service.
--Existing bus service on city streets would continue to degrade due to traffic congestion. ICT service would improve Seattle's transportation system, providing more transportation choices and less dependency on cars. "

2-2 5th paragraph, 2nd sentence. Two of these corridors were Lake City/Northgate/ Ballard/Downtown Seattle and West Seattle/Downtown Seattle.

2-3 3rd paragraph, last sentence. The City's ICT study focused on five (5) not seven (7) corridors feasible for intermediate capacity transit.

2-8 Under 2.5.1 Regional Planning Context. The City of Seattle's Comprehensive Plan and Transportation Strategic Plan should be highlighted as well to provide a context for the ICT study.

2-8 The Comprehensive Plan should be described as follows: "First adopted in 1994, and amended annually, the City of Seattle Comprehensive Plan, Toward a Sustainable Seattle, is a 20-year policy plan designed to articulate a vision of how Seattle will grow in ways that sustain its citizens' values. Under the urban village strategy, the Comprehensive Plan provides a set of goals and policies aiming to concentrate growth into identified "urban villages" and "urban centers" where the highest densities of housing, jobs, and services already exist. This will place more residents near jobs and shopping opportunities, making it easier for them to conduct more of their daily business without driving. The concentration of residents and employees will also support better transit service. The Transportation Element calls for reducing dependence on cars, and for making transit, bicycling, and walking more convenient and attractive, particularly for commute trips. It calls for securing the funds necessary to preserve and maintain existing transportation facilities. It seeks to maintain and improve the ability to move freight and goods, and to preserve the character and livability of our neighborhoods."

2-8 The Transportation Strategic Plan (TSP) is the City of Seattle's guide for achieving the transportation goals outlined in the Comprehensive Plan. It outlines the specific strategies and actions required to achieve the transportation goals in the Comprehensive Plan. The TSP maps out the policies and investments required to achieve a healthy, efficient transportation system. The TSP proposed the Seattle Transit Initiative and the Intermediate Capacity Transit Study aimed at improving Seattle's transit service.

Project Description

3-21 Alignment of 6.1 and 6.2 on either side of Delridge stations appears to be incorrectly shown and labeled. Alignment 6.2 should be paired with Delridge 2 and so forth. Mistake also appears elsewhere including p.1-11, 4-137, and Exec Summary, fig. 1-6.

3-32 Text states "the alignment would continue further north along the east side of Warren Avenue W", however, drawing L03-10-02 (p 51 of 230) shows the alignment on the west side of Warren Ave N (not W). Which is correct?

3-40 Drawing GSAV-3D-A1001 in Appendix L shows site extending well into Parks property (about 130 feet, as scaled off drawing) but no detail is given for the rationale of the dimension of the site. How was the maximum footprint on this site determined?

Transportation

Under Parking Demand section for Ballard and all other segments, reference should be made to Appendix O where the parking study results are given by station area to better buttress these statements on utilization.

The Synchro files should be provided to SDOT. Some general mitigation tools used when signals (critical movements) are impacted by the SMP would be to revise signal timing/synchronization, adjust turning lane queue storage bay length, or revised channelization.

Impacts related to pedestrian conflicts with turning vehicles will create traffic congestion. The SMP may not use the default value of 50 pedestrians per hour in the CBD or near station areas. Near station areas and within the CBD the SMP should instead use actual counts and/or estimated counts that include volumes at near by intersections and station area pedestrian volumes.

The signal network in the CBD is coordinated and actuated signal timing cannot be accommodated.

4-1 It would benefit the readability and use of the Transportation section if an introductory section were added, similar to the introductory text on page 1 of the 4.3 Land Use and Neighborhoods Section.

4-1 Urban Centers/Villages: Belltown, Commercial Core, and Pioneer Square are each urban villages within the Downtown Urban Center. Seattle Center should be referred to as the Uptown Urban Center.

4-1 Include major bicycle facilities in among the description of "Major Transportation Facilities."

4-3 The description of the Queen Anne Avenue N/First Avenue N and Mercer Street bus transfer point should include Routes 15 local and 18 local.

4-3 Paragraph 5: what is the definition of a major transfer point?

4-4 Last paragraph. Check with Sound Transit about status of Route 570. Last May they were proposing that existing routing on Fauntleroy be combined with an extended Route 560 between the Airport and West Seattle. The segment between Alaska Junction and the International District would be deleted. Service between White Center, Fauntleroy, West Seattle, and downtown Seattle is provided by King County Metro Routes 20, 21, 22, 54, 55, 116, 118, 119, 136, and 137.

4-4 The description of the Sounder service notes that "the future Weller/King station of the Green Line would be within walking distance of King Street Station". The distance should be specified.

4-5 Other transit facilities - 1st bullet - Amtrak also provides service to Portland, Eugene & Los Angeles.

4-8 How is the term "regional" being defined when referring to "regional trails"? Delete "regional" or replace with "separated, multi-use."

4-8 DEIS says "For analysis purposes, the 1/2 mile distance was assumed to represent a reasonable travel distance for pedestrians and bicyclists accessing a transit station". Bicyclists average about 12 miles per hour in an urban setting, pedestrians only about 3.5 to 4.5 miles per hour. Consequently, a "reasonable" travel distance for these modes will be very different. The City suggests that a three mile travel distance be used as the travel distance to stations for bicyclists (about a 15 to 20 minute bike ride); and a maximum 1/2 mile travel distance to be used for pedestrians.

4-16 The Seattle Harbor Patrol is also…." should read "The Seattle Police Harbor Patrol is also…."

4-18 Last paragraph. "In general" or "Overall", all of the Green Line alternatives lead to beneficial changes in transit service. Some of the Metro route restructuring/reallocations could negatively impact some transit riders or potential transit riders travel times.

4-19 Last paragraph. Please include City of Seattle with SMP and Metro as working together to develop bus service proposals.

4-20 Service Frequency LOS- The Service Frequency LOS methodology in the DEIS is different than that used in the TCQSM. The TCQSM determines this LOS by destination from a given stop. If there is a transit trip with a transfer then the LOS for the trip would be the lowest LOS of the two transit rides. The screenline method for LOS used in the DEIS does not provide this information.

4-20 In the Service Frequency section, the text notes that "the year 2020 No Action service frequency LOS is also an improvement over existing LOS". Please indicate why this LOS is expected to improve.

4-22 Service Frequency: Please be more specific on the process used to develop the 'weighted average PM peak hour headways". Describe the technique, how 'weighting' was applied, and how weighting adjusted the average PM peak hour headways? If averaging, describe the range of frequencies during the peak hour service hours for transit years 2003, and year 2020 no action alternative. Describe the process of weighted averaging, including the range of frequencies to more clearly illustrate the 'Peak Hour Service Frequencies". Then compare the weighted averaging of the 2020 No Action and the 2020 Green Line Alternatives. Because this 'weighting' process is not included in the TCQSM, the additional information on how the 'weighted average was developed would help determine if the change in frequency is an advantage or disadvantage. Do the Average Bus Service Hours per Day presented in Table 4.1-11 represent p.m. peak hour service hours or daily service hours?

4-22 Table 4.1-9-Comparative Peak Hour Service Frequencies. Some explanatory text is needed to note that this table and others in this section compare the no action with a one-seat bus ride with the Green Line, which is a 2-seat ride for at least 50 percent of monorail riders (taking the bus to monorail station stop) with likely less reliability than those riders walking to stations directly.

4-22 Hours of Service LOS--This LOS measure can be used to show how service is effected in the Green Line corridor and in corridors that receive more service or less service due to Metro bus restructures.

4-23 The text states that "with the Green Line, many of the bus transit routes traversing the corridor may be truncated or eliminated to provide feeder service to the Green Line". Do the bus service hours presented in Table 4.1-11 reflect this potential truncation/elimination?

4-24 Transit travel time - Draft does not mention whether the 'average walk time to the station' would improve or increase compared to existing conditions.

4-24 The data regarding on-time performance of the monorail system note that "studies of monorail systems in the United States have shown that the monorail technology is between 99.5 percent and 99.9 percent reliable…" Are these systems operating in urban settings comparable to Seattle or Vancouver? If not, how applicable are these on-time results to gauging potential future on-time performance of the Seattle monorail system?

4-24 Table 4.1-12 has a column of data ("0.00-0.10," "0.11-0.20," etc.); it is not clear what these numbers represent.

4-25 Table 4.1-13 provides information on existing bus transit reliability, but does not indicate whether existing reliability measurements are assumed to hold for the future No-Action alternative. If this is the assumption, it should be explicitly stated. (If not, the 2020 No-Action bus transit reliability estimates should be provided.)

4-26 Table 4.1-13 implies that the estimated reliability of the Green Line will be the same (0.09 average coefficient of variation and LOS A) at all locations. As the coefficient of variation and level of service is a system-wide estimate, the table would be more accurate if the reliability information were shown once, with an indication that this system-wide information is a proxy for location-specific data.

4-26 The DEIS analysis should describe passenger load impacts on monorail & feeder lines versus one-seat rides with existing bus service.

4-27 Last paragraph. Street re-classification requires City Council approval.

4-27 Transfers - No information on how the Seattle transit system's transfer rate will be impacted.

4-29 Table 4-1-17 Bicycle trips should be listed separately from pedestrian trips.

4-32 Last paragraph. The document should note whether the ridership model assumes joint light rail train and bus use of the downtown transit tunnel.

4-35, 4-36 Pedestrian and Bicycle Facilities Analysis: Pedestrian LOS was analyzed using the methodology from the Highway Capacity Manual. However, the language does not make it clear what conclusions were drawn from this analysis.

4-36 In the second paragraph, there is a discussion of ADA requirements. The reader is directed to look at conceptual station footprints used for EIS analysis. These drawings do not show enough detail to ensure compliance with ADA and safety standards. It also does not identify where key pedestrian generators are which would have a significant connection to the station areas and therefore might require further analysis of pedestrian corridors.

4-43 First full paragraph where states that up to 90 spaces could be lost with addition of left and/or U-turn channelization. The "could" should be changed to "would."

4-44 Truck Circulation impacts: Instead of state classifications, refer to actual volumes from traffic records and/or City Major Truck Street classifications. The City does not use the state T-1 to T-5 system.

4-44 A special assessment should be performed for those street and roadways where over legal trips movements are known to operate to determine their ability to have alternative routes that can accommodate the over legal trip needs.

4-50/58 The DEIS should acknowledge the Thomas Street Overpass project, a funded project which will create a non-motorized connection between the Elliott Bay Trail (a major facility for bicyclists traveling from/to downtown) and the Mercer Station.

4-54 Table 4.1-34. SDOT will require the SMP to include signalized intersections on Mercer, especially Mercer/5th N in the LOS evaluation.

4-58 Bicycle and pedestrian access near 5th/Broad Station: The Dexter Avenue Bicycle lanes are not accessible to the 5th/Broad station due to Aurora Avenue. Aurora is also a barrier to pedestrian access. This should be noted in the DEIS.

4-61 1st paragraph, first sentence. Alternative 3.1 is stated to be located in the planting area, but the parking section states that the parking lane will be used. Please clarify.

4-61 Last paragraph, 1st sentence. Text should clarify that parking would be eliminated from the east side of 2nd Ave. Any new parking provided between columns on the west side of the street would be paid parking of in-kind meter technology. The City is launching a major effort this year to replace most of the single-space parking meters with pay station technology, where one or two kiosks are located on a block. (Also applies to statement on page 4-66.)

4-64-65 Does the monorail downtown segment pass through or near any High-Accident Locations?

4-66 1st line. 2nd Ave has a bike lane and a west-side parking lane. They are not a shared facility.

4-67 Parking meters in the City of Seattle operate between 8am-6pm Monday through Saturday unless where arterial parking restrictions or other space designations such as bus layover or carpool priority.

4-71 3rd paragraph. References to 1st Ave S, where guideway columns located in parking/travel lane. The "time-restricted" text should be changed to "peak period restrictions" since no parking is allowed during this time.

4-72 Last sentence in 1st paragraph. This sentence seems a bit overly generalized given the narrowness of the sidewalk on the west side of 4th Ave S and the very auto-oriented nature of the signalized intersection at 4th Ave S and S Jackson St

4-73 Table 4.1-48 states that 95 spaces from Seahawks Stadium North Parking lot will be displaced. This is different than what is indicated in the Station Footprint Plan. Any work in this area needs to be coordinated with the development plans for this property.

4-77 The discussion of a traffic signal at the California Avenue SW/SW Brandon Street intersection is confusing. The text states that Alternative 6.1 could provide a traffic signal at this intersection, but such a signal is already assumed at this intersection (see page 4-75 and Table 4.1-50). Additionally, the results in Table 4.1-50 indicate that such a signal would be required under Alternative 6.2 as well, as the average seconds of delay at this intersection would increase by 5.5 seconds in 2010 and 10.3 seconds in 2020.

4-78 Table 4.1-51 shows a footnote superscript in the 2020 Alt. 6.1 column, with no corresponding footnote.

4-81 Table 4.1-54, footnote c, refers to Table 4.1-56, when Table 4.1-55 probably is intended.

4-83 Fauntleroy Way SW is a Major Truck Street

4-89 Under Alternative 1.2 in the Ballard segment, reference is made to a new signalized intersection at NW 73rd Street/15th Avenue NW. Is this meant to refer to NW 63rd Street/15th Avenue NW?

4-89 Ballard segment - Alt 1.1 - first paragraph. If this paragraph is intended to summarize impacts, than the number of parking spaces removed should be included. It would also be advisable to move up the discussion of parking loss mitigation to immediately follow this paragraph, rather than its current location 3 paragraphs later.

4-91 Regarding the crosswalk marking for the north leg of 15th Ave NW and NW 87th St. Please see draft SDOT Director's Rule regarding guidelines for installation of marked crosswalks. SDOT does not recommend marking unsignalized crosswalks that cross 4 or more lanes of traffic.

4-94 With adding 20 parking spaces along 5th Ave N, depending the existing parking controls and adjacent land uses, paid parking technology would be installed in these 20 spaces, or load zones considered.

4-94 Where all-day parking was indicated to be added. The City will install paid parking technology along 2nd Ave, except where bus zone locations or where no parking is allowed.

4-95 The counts used for the 2nd Avenue & Columbia analysis appear to have an excess volume of turns and faulty LOS results.

4-98 The Significant Unavoidable Adverse Impacts section (4.1.4) indicates that the loss of on-street and off-street parking spaces in the Downtown segment "could be considered a significant unavoidable adverse impact". However, the parking discussion for the Downtown segment states "the parking losses shown in Table 4.1-43 are considered to be significant". This conclusion needs to be clearly carried through to Section 4.1.4.

Displacements & Relocation

4-67 Table 4.1-44 indicates a parking displacement at the Avis Parking Garage. The parking associated with the Avis rental car business is critical to the operation of the business, and should be identified as a business displacement if the lost parking spaces will make the operation of the car rental business infeasible. (Displacements & Relocation Section)

4-102 Table 4.2-1 does not allow the reader to connect the information on full and partial acquisitions to Table Q-1 in Appendix Q, which lists the parcels potentially affected by property acquisitions. This connection should be provided.

4-108 Table 4.2-3 does not allow the reader to connect the information on displaced businesses and households to the list of potentially affected properties in Table Q-1 in Appendix Q. This information should be provided.

4-11 The DEIS states "no major venues or performance spaces would be displaced." However, the Northwest Rooms and the Northwest Rooms courtyard are festival performance spaces. Also, The Fun Forest should be included as a business that would be displaced - not just two Fun Forest attractions. Mitigation to the Fun Forest for the two affected rides could include either relocation of the rides to the space currently occupied by the existing Monorail station, including construction costs to remove the station; or compensation to the Fun Forest for the lost revenue that these rides generate.

4-113 States "Development of the Seattle Center/Queen Anne 2 (South) station (Alternative 3.2) could require partial acquisition of a different area of the same parcel, requiring the removal of the Sonics/Storm Team Store." This station is part of Alt 3.3 and 3.5

Land Use

GENERAL The Green Line is an intermediate capacity system. Where adopted plans, policies and other references in this section and in Appendix U refer to a high-capacity system, that difference in consistency should be noted.

GENERAL Provide definition of "community resource" that is being used; if from NEPA guidance, cite document and page number. Generally, it is not clear in each of the segments what geographic area of coverage is assumed for identifying community resources in the "vicinity" of various station alternatives. Some segments (or station alternatives) appear to apply vicinity broadly, others more narrowly. "Vicinity" should refer to roughly the same geographic area across the segments and station alternatives, or the text should clearly indicate why a particular vicinity is considerably larger or smaller than normal. For example, under Crown Hill station alternatives, two elementary schools are listed that are over one-half mile from the station (North Beach and Loyal Heights). On the other hand, the Yesler station alternative does not identify Fire Station 10, which is approximately 800' from the station site. Other examples of vicinity issues include: the Dravus station alternatives note that Fire Station 23 is a community resource; however, Fire Station 20 is closer to this station area. Also, Lawton Elementary School is 4300' from the station area. The Howe station alternative section identifies several community resources that are some distance from the proposed station area, including Fire Station 41 (6000'), Coe Elementary School (3000'), McClure Middle School (4300'), and Seattle Country Day School (7300'). The Elliott and Mercer station alternatives section identifies several community resources that are some distance from the proposed station area, including St. Anne School (3100'), Fire Station 8 (3500'), and John Hay Elementary (4500'). Cooper Elementary School is approximately 2300' from the Delridge station area. Holy Rosary Elementary School and Seattle Lutheran School are both within 2000' of the Avalon station area. Fire Station 32 is approximately 1500' from the Alaska Junction station area. Fairmount Park Elementary is approximately 3100' from the Morgan Junction station area.

GENERAL It would be helpful to identify important major transit and street elements of existing conditions, such as entrances to the Downtown Seattle Transit Tunnel (noted once in description of the Yesler alternative) and major arterials near stations, such as Broad and Denny

near the Seattle Center stations. This will help provide a full picture of existing conditions from a pedestrian usage and land use perspective.

4-118 The text refers to the Green Line connecting "the City's urban center" to various urban villages. It should read "the City's urban centers" to reflect both the Downtown and Seattle Center Urban Centers.

4-119 1st paragraph: institutional is also a land use and is noted on Fig 4.3.1; please note in text as well.

4-121 Minor comment: Table 4.3-2 refers to the alignment segment of NW 46th Street/15th Avenue SW; this should be 15th Avenue NW.

4-124 Figure 4.3-2 Elliott/Mercer Street is not labeled on the figure.

4-125 Dravus 1 - incoherent sentence: "across 16th NW to the west of the 16th Avenue NW"

4-126 In the Elliott and Mercer Station Alternatives section, it is unclear why the text notes that "zoning capacity allows additional development in the area". Although this statement is not made elsewhere, it likely applies to virtually every station area, particularly outside downtown. Please clarify the purpose of this reference.

4-126 6th paragraph. While this paragraph states that 6.5 million people visit Seattle Center each year, the number should be 10 million, and the document should explicitly state that Seattle Center is a regional destination. This point is more explicitly acknowledged in the impact section, page 4-144.

4-128 6th paragraph. To remain consistent with the Ballard and Interbay segment sections, there should be some reference to the applicable neighborhood plans. (Also applies to 4-131, 2nd paragraph; 4-136, 3rd paragraph)

4-132 Pike Station: 1st paragraph: presumably land uses within 1/4 mile include residential as well as office and retail.

4-132 2nd paragraph. Acknowledgment of the Wells Fargo plaza on the east side of Second Avenue as a significant open space in the downtown would be appropriate, as it is acknowledged in the impact section, page 4-151.

4-133 1st paragraph: Int'l District is an urban village, not an urban center; it is part of the Downtown Urban Center. Note that the International District, like Pioneer Square, is a Special Review District (SMC Chapter 23.66) and, like Pioneer Square Mixed, is a zone (SMC 23.49.198)

4-133 1st paragraph, 1st sentence that begins "The SODO segment is made up of two neighborhoods..." is incorrect. The segment includes three neighborhoods, including Pioneer Square.

4-133 Last paragraph: Weller Street: Add neighborhood-serving retail and residential to list of uses in last sentence.

4-135 The new on-ramp to eastbound I-90 is being constructed in the S. Atlantic St right-of-way, not at S. Royal Brougham Way, as indicated in the Safeco Field station alternative

4-135 Artists' studios are also on 1st Avenue.

4-136 Industrial Business (2nd paragraph) should be Industrial Buffer.

4-138 Alaska Junction: This would be more accurately expressed as: "with a gradual transition to medium-density residential with one high-rise building."

4-140 4th paragraph, 2nd sentence that begins "However, given the predominantly ..." Please explain reasoning/rationale for this statement, which appears to confuse existing uses and the effect of the scale of the proposed project on those uses and future development. See also, general comment about distinguishing between compatibility with uses and compatibility with height, bulk and scale.

4-140 3rd paragraph, 2nd sentence that begins "No residences are displaced ..." compares number of properties and businesses acquired and displaced to number of blocks traveled. For the sake of fair comparison, the number of businesses and properties should be listed rather than or in addition to the number of blocks.

4-141 3rd paragraph, 3rd sentence that begins "The development of the monorail stations and facilities..." Please explain reasoning and rationale for this statement, especially in light of impacts to access to businesses along the west side of 15th NW.

4-141 "majority of residences lie to the west and north". Does this mean to the west of 15th and to the north of Market?

4-141 1st sentence (continuing from p.140): "no significant impact...given the increasing height of the bridge and the overall industrial/maritime uses…" Please clarify this sentence - how does the increasing height of the bridge help address impact?

4-142 (1st sentence) The statement is made that "With the Green Line guideway in the middle of the street, west side businesses could remain more visible..." Presumably, this statement can be made more confidently as "would remain more visible." However, if visibility is a benefit of Alternative 1.2, then impacts on visibility should be noted as an impact under Alternative 1.1.

4-142 last full paragraph: the 2nd sentence is incoherent.

4-142 There is a difference between the description of Interbay on this page and on page 4-123, where it is described as multi-family residential, with open space, athletic fields, retail, service, office, institutional uses, and recreational facilities.) Please explain why the fuller description of Interbay is not used here, where a different description is used to support the statement that there is lower potential for land use or neighborhood impacts.

4-143 First paragraph: A statement about improved mobility and area-wide access follows a discussion of displacement of the QFC and enumeration of high populations of low-income households. How is improved mobility and access relevant to this discussion of specific impacts?

4-143 The discussion of the Elliott and Mercer 1 (Center) station states that "the center of street alignment would increase delays for southbound vehicles turning east onto Mercer Street at peak hours, but delays would remain at acceptable levels". The text should either provide specific information about changes in delays at this intersection, or provide a cross-reference to the location in the Transportation section where this information can be found.

4-145 Alt 3.1, first paragraph, last sentence: Reference to long-term replanting and landscaping should be cross-referenced in mitigation if this is a proposed mitigation.

4-145 Second full paragraph - the reference to "some of the previous layouts of these events" could be more clearly stated as "festival layouts from previous years."

4-145 Last partial paragraph - the discussion of Monorail ridership at Seattle Center would be easier to understand and more comprehensive if presented with a timeline - current ridership, expected impacts during construction (once current monorail line is removed), initial ridership from new monorail line (at new location) and 2020 ridership. The impacts of each of these time periods on Seattle Center functions should then be included in the analysis.

4-145 The discussion regarding alternatives and which ones would require the removal of trees is not clear. The first sentence implies that only the Thomas alternative would require the removal of trees, while in fact both the Republican and Thomas Street alternatives would require the removal of trees at Seattle Center. The stand-alone statement that the Mercer options "would also pass the Mercer Theater District and require the removal of mature trees on the east side of the block..." implies that the trees removed in the Mercer option are more significant. If this is so, this needs to be explained more thoroughly. Suggest addressing the alternatives separately and not in the same sentence for fairness of comparison.

4-146 First full paragraph. Alternative 4.1 referenced in 3rd sentence should be "Section" to refer to Transportation section.

4-146 The statement "primary effect is visual" should also cross-reference impacts on trees - please cross-reference Plants and Animals section.

4-146 There is little if any mention of the impacts to the greenbelt at the west end of Memorial Stadium should Alt 3.1 be chosen. This is a significant green belt from a visual and bird habitat standpoint. It is also the site for Seattle Center's propane storage area (see comment on page 4-456 for details).

4-146 to 4-148 Discussion of "recognized defining line" or "established line defining separate zones of the Center", is overstated. These zones were for use in improving the readability of the Master Planning document, and did not imply any separate zones on the ground.

4-147 3rd full paragraph. The statement is made that a large amount of real estate would be removed from private supply. Is this an impact? What would the consequences of the removal be? Please cross-reference analysis of this in Economics.

4-147 Statement is made that "noise impacts would be lessened" - please cross-reference the page in the Noise section where this is analyzed.

4-148 First Paragraph: Reference to loss of parking on the north edge of Mercer because of addition of columns - please cross reference transportation section and identify effect on utilization rate.

4-148 Alternative 3.3 (Thomas) last paragraph: vegetation removal - cross reference Plants and Animals

4-148 Concerning the statement (about the Thomas Street route – Alternative 3.3) "Development of the Green Line would require avoiding conflicts…" How would conflicts be avoided? What impacts would result if conflicts are not avoided?

4-149 The discussion of impacts of Alternative 3.5 (Denny) should indicate the impacts of guideway and column placement along Denny Way.

4-149 The discussion of neighborhood impacts in the Downtown segment notes that "the visual and setting impacts to historic resources would affect the visual context of some historic resources, particularly in Pioneer Square. However, the improved access to the Pioneer Square Historic District and the Pike Place Market Historic District would likely benefit continued economic vitality." It is not clear how enhancing economic vitality will reduce impacts to the visual context of historic resources.

4-150 Alternative 4.1, 3rd paragraph: Re: "loss of surface parking" - quantify the impact of this loss on utilization and cross-reference Transportation.

4-150 Fourth full paragraph: identify the demolition of the Centennial Building as a significant adverse impact and cross-reference Cultural/Historical Resources. (Land Use Section)

4-151 2nd paragraph: "An adverse effect to the historic resources has been identified…" State specifically what the impact is, whether it is a significant adverse impact, and cross reference cultural/historic resources.

4-151 Pike 2 (East) - Please quantify the effect of loss of parking on utilization rate and cross-reference Transportation.

4-151 Madison 2 (East) Discuss whether loss of the plaza affects open space goals for downtown.

4-152 1st sentence: There is a reference to the loss of two major sources of parking. Quantify effect of parking loss on utilization and cross-reference Transportation.

4-151 Alt. 4.2, second paragraph. "The presence of the overhead guideway could affect future development of the property to the intensities allowed under existing zoning." Please clarify how future development would be affected.

4-151 1st paragraph: The statement: "If the station were designed to accommodate the potential for future development, it could support plans and zoning…" Please state whether the station will be designed to accommodate this potential. If it is not so designed, please state whether it will support plans and zoning for the area.

4-152 A reference to loss of 200 parking spaces is made. Please quantify the effect of this loss on utilization rate and cross-reference Transportation.

4-152 Madison (3): Does this center platform station with a mezzanine have the same visual impacts as Pike (3)?

4-152 Yesler (2): What does "both alternatives" refer to? Is this a reference to something besides the Yesler (2) alternative?

4-152 Under SODO segment, regarding North Stadium parking lot. The Transportation Section lists this loss as 95 spaces in Table 4.1-49, page 73

4-153 Third full paragraph states that Lander 2 would require the Home Depot parking area, although the Transportation Section Table 4.1-49 lists that Lander 2 affects the SODO customer surface parking lots at 131 spaces. Is this the same parking area?

4-154 4th full paragraph: Why state here that parking needs to be replaced (for a large retail store) and not for the QFC at Dravus or the Walgreen's at 15th NW or at the grocery store/coffee shop referred to in this same paragraph?

4-154 Last sentence, second to last paragraph: Recommend changing the following sentence (additions in parentheses) "Improved access to the Longfellow Creek Greenspace would benefit the public to a degree but could adversely impact creek habitat and water quality if the creek is disturbed by (increased numbers) of the visiting public - (pedestrians and vehicles associated with the station and with future development of support facilities).

4-155 The text notes that "Alternative 6.2 has the potential to remove more parking spaces than Alternative 6.1". It should be noted whether these are on-street or off-street spaces (or both).

4-155 Last paragraph in Section 4.3.2.1: Recommend adding to the end of the following sentence (additions in parentheses): The Delridge Station 2 (Andover) would be further removed from Longfellow Creek (which might buffer the creek and greenspace from some of the increased pedestrian traffic associated with the station, but would not buffer it from increased pedestrian and vehicular associated with future development of on-street support facilities).

4-155 and 4-156 Under 4.3.2.2 Consistency with Adopted Plans and Policies: Please add the adopted Longfellow Creek Watershed Action Plan, adopted by Seattle City Council 28620, October 1992 to the list of planning documents.

4-156 It is not clear what is intended by the last sentence on this page, which states that "The Green Line would support and just conflict with the general public goals and objectives of these plans…"

4-158 For Alternatives 3.1, 3.2. 3.3, 3.5 the statement is made "However, the Green Line's transportation improvements could also provide offsetting benefits, (to the displaced Key Arena operations offices) which would also reduce the impact." Transportation benefits can not be used to "offset" non-transportation impacts.

Visual Quality

4-171 SEPA viewpoint Kinnear Park is shown in the view shed which by definition means it is visible.

4-171 Table 4.5-1 Add Ballard Bridge and Walrus Level as a visual resources under visual resource listing.

4-187 The description of Queen Anne/Seattle Center/Belltown Segment should include a description of the Center itself including the theater, museums, sports and other cultural facilities.

4-189 The description of the Downtown Segment should include the Financial District, the edge of the retail core as well as Pike and Pioneer Square Historic Districts.

4-190 The name of the 'Vulcan Building' is the 505 Union Station building.

4-190 Include the Wells Fargo Open Space in the list of arcades, plazas and open spaces.

4-198 through 4-205 Description of impacts for this segment should refer to "affected" trees inventoried in Appendix W.

4-200 Table 4.5-11 Legend does not include "B".

4-200 through 4-205 While some detailed information is present on number of trees to be removed, it is not consistently detailed. Additionally, this information should be presented in Section 4.15

4-201 See notes (to p. 4-456) on tree trimming of Seattle Center trees in Section 4.15 Plants and Animals

4-201 See notes (to p. 4-457) on issues with planting trees in lawns at Seattle Center in Section 4.15 Plants and Animals

4-205 "The Center House, a historic resource, would have adverse impacts..." sounds as if the Center House is the source rather than the object of the impacts.

4-206, 4-209 Term "Shade Protected" in table is not explained.

4-207 The list of Downtown streets where upper level setbacks are required should also include Seneca Street.

4-210 Change language from "could" to "would" be obstructed in reference to visual impact on the decorative band between the third and fourth stories of Bon-Macy's and the Securities Building.

4-216 Table 4.5-15 should list "Potential Impact" for West Seattle Stadium as "Proposed changes will cause impacts…"

Air Quality

4-221 Third full paragraph concerning Clean Air Agency Regulation I. The DEIS states that these regulations "may" apply. Reader should be referred to 4.6.2.1 for additional information on how the determination is made.

Noise & Vibration

4-234-235 4.7.1.3 Last paragraph refers to Seattle Noise Ordinance 25.08.425.C; Clarification: this section is only for construction that takes place in commercial zones where both generator and receiver are in the commercial zone.

4-236 Table 4.7-6: In this table the Fisher Pavilion Roof is used as a measurement location. Was any construction taking place in the building or was any mechanical equipment in operation during the measurement?

4-238 Section 4.7.1.7, paragraph 1: While it is true that average monorail train speeds will be lower than 50 mph, many segments of the SMP guideway will permit 50 mph speeds, and any adjacent structures will receive higher vibration levels on those segments. This should be included in the paragraph for a balanced assessment of the expected vibration levels due to train speed.

4-239 Section 4.7.1.7, paragraph 2: The date and laboratory location of the last NBS traceable laboratory calibration of the Spectrum Analyzer and Vibration Calibrator should be provided in Appendix R, with the expiration dates.

4-239 Section 4.7.1.7, paragraph 5: The duration of the RMS averaging should be stated here (not just in Table 7).

4-239 Section 4.7.1.7, paragraph 6: Criteria for vibration-sensitive facilities would be appropriate at this point in the DEIS text, and should be provided.

4-239 Section 4.7.1.7: How were monorail speeds measured? What is the uncertainty of the speeds?

4-239 Section 4.7.1.7, last paragraph on this page: The 12 dB increase for a distance of 10 feet does not say relative to what distance, i.e. starting where?

4-240 Section 4.7.1.7, first paragraph on this page: The statement of method implies that anomalous high data is being thrown out. What is this based on?

4-240 Section 4.7.1.7, first paragraph on this page: The source of the "published data" should be cited, and its detailed content provided in Appendix R. The FTA curves are not conservatively high and this claim should be removed from the paragraph. See comments on section 4.7.1.8, below, for why the FTA curves are average values, not high values, for the SMP sensitive receiver site conditions.

4-240 Section 4.7.1.7, 2nd paragraph on this page: This repeats the speed effect discussion above, and should be deleted.

4-241 Table 4.7-7. Most of the data in this table, for the passing monorail, shows vibration levels within the noise floor. The implications of this should be discussed.

4-241 Section 4.7.1.8, paragraph 1 and 2. The likelihood of two trains passing an expansion joint simultaneously depends upon the length of the trains and the spacing of the expansion joints. Provide a calculation of the fraction of train passages where the assumed condition would occur, and discuss the implications for the expected vibration levels. Revise paragraph 2, removing the claim of conservatively high, unless this can be justified with a cogent and complete analysis of the 50-mph, two-train scenario.

4-242 Section 4.7.1.8. The text of paragraph 4, taken from FTA report (paragraph 2, p. 10-3), claims that the distance propagation curve for rubber-tired vehicles is an upper range of the expected vibration, unless there are "extenuating circumstances." The subsurface rather than at-grade bearing of the monorail columns, and the wheel impacts on beam expansion joints, are just such extenuating circumstances. The FTA curve is derived from at-grade vibration data, on smooth surfaces, noted on p. 10-5 of the FTA report: "Rubber-tire vehicles rarely create ground-borne vibration problems unless there is a discontinuity or bump in the road that causes the vibration. The curve in figure 10-1 shows the vibration level for a typical bus operating on smooth roadway." Claims in the DEIS that the curve in fig. 4.7-4 is an upper range should be removed.

4-242 Section 4.7.1.8, paragraph 3. Why is the level difference 6 dB and not 3 dB? (The definition of dB is an energy ratio.) This should be examined and revised if necessary.

4-243 Since the curve of Figs. 4.7-3 and 4.7-4 represent a single bus drive-by, whereas the monorail is effectively a sequence of buses, dynamically linked to each other, the character of the propagation curve may be substantially affected. A higher level of the curve at mid-distances should be assumed, in the range from 30 to 150 feet, to allow for the uncertainty in the vibration propagation due to these substantial differences.

4-243 The attenuation of vibration with distance is provided as fig. 4.7-3, from FTA manual's fig. 10-1, with rubber tired vehicles. The figure following (fig. 4.7-4), derived for the monorail rubber tired train from this generalized propagation curve, has an entirely different character due to an unfortunate change in the abscissa scale (linear rather than exponential). Fig. 4.7-4 should be revised to allow direct comparison.

4-243 The analysis used to derive fig. 4.7-4 should be included in Appendix R to demonstrate validity of the derived values, and the assumptions involved in the analysis should also be stated there.

4-244 A site test using a impact demolition tool (back-hoe mounted), driving the ground at possible guideway column locations, should be included as an optional means to explore vibration-induced noise sensitivity at all facilities listed. Add this requirement to the construction vibration section.

4-247 Traction Power Substations - given the number of existing traction power substations in the area (Metro's trolley bus program, for instance), it should be relatively easy to do noise measurements and projections.

4-247-4-264 4.7.2.2 The distance between the rail and the adjacent buildings along the routes are not disclosed. This should be on a table for each alternative.

4-256 States "During quiet times in the Center, the Green Line would be clearly audible at outdoor locations on the lawn north of the International Fountain, but Green Line noise would not substantially increase sound levels over the existing acoustic environment." This statement appears to apply to Alt 3.1, not Alt 3.2

Public Services & Utilities

4-280 "To maximize the power consumption efficiency of the monorail trains and ensure good power quality, the monorail system supplier will he required to maintain average power factor of 0.95 and to comply with the IEEEE, Inc. Standard 519-1992." Identify what the supplier means. Will the average power factor and standard be contained in the DBOM contract? Please include statement concerning these specifications and the contract.

4-280 Table 4.8-3. Green Line Operational Energy Use in KVA. It is not clear whether "Stations" load is typical load for one station or the total stations' load. Please clarify.

4-280 "Traction power substations" is used in paragraph 2 while "train propulsion system substations" is used in paragraph 3. Please clarify.

4-281 4.8.3 - Mitigation. Reference is made to implementing SMP's "environmental sustainability policies" without further reference or explanation.

4-281 Paragraph one please add: Regenerative power would be restricted to the Monorail electrical system and would not pass beyond the SCL point of connection.

4-281 "SMP will work with SCL to implement SMP's environmental sustainability policies as it designs facilities". Please include specific examples of how such policies could be implemented as they pertain to electrical energy. One example might be use of regenerative braking.

4-290 Distribution lines are almost always in a horizontal configuration, not a vertical configuration, as stated here.

4-292 Reference to the location of specific recommendations for improving vehicle access and circulation in locations where guideway columns would be provided in an existing center two-way left turn lane should be 4.1.3 not 4.1.6.

4-292 Seattle Center-SCL owns, operates and maintains the campus distribution system (26kV).

4-292 4.9.2.1- Emergency services could be impacted if a monorail train gets stuck under or near to a Seattle City Light feeder that has only the minimum NESC safety clearance. If there is not enough clearance for emergency personnel to work safely, extra time would be required for Seattle City Light to deenergize and clear the lines, if possible.

4-295 Sec. 4.9.2.2, 3rd paragraph, 3rd sentence: Add "or guideway beams" after "Where foundations"

4-296 9.9.2.1 comment - Need to consider lateral foundation loads on close utilities.

4-296 9.9.2.1 comment - Need to consider dynamic (vibratory) foundation loading due to the train operation. Close utilities could be impacted from vibration induced settlement.

4-296 4.9.2.2 First full paragraph, last sentence. The way the project is phased may require service from Canal, Broad, South or Delridge substations.

4-296 "Power demand for Green line operation would not significantly affect City Light's regional capacity, although upgrades to some transmission lines and power substations may be required." Replace "regional capacity" with "sources of electrical energy available to SCL", and add "due to limited capacity of the existing distribution infrastructure to distribute electrical energy" at the end of this sentence.

4-296 4.9.2.2 Fourth paragraph last sentence "Design and construction of foundations systems would not ..." Depending upon soil conditions and construction methods, settlement of utilities or pipes could happen. This will need to be mitigated during design.

4-296 "As discussed in Section 4.8, Energy, the Green Line would be replacing fossil fuel sources for transportation, but could potentially increase the electricity demand and consumption on the existing electrical system in the project area." Change "could potentially" to "would".

4-296 The DEIS refers to fencing in the guideway at the Delridge Station to protect the creek. Please add to the long-term utility impacts or mitigation section that the SPU access gate needs to be maintained to allow the utility to conduct spawning surveys and to maintain the trash rack at the inlet of the Andover culvert.

4-290 4.9.1.2 - Electrical Service. Seattle City Light has a number of electrical network facilities and/or duct banks located along certain alignment sections or that cross alignment segments. SMP must work closely with SCL in determining appropriate locations of guideway and station columns so as to avoid impacting these duct banks. Segment impacted include 3.1, 3.2, 3.3, 3.5, 4.1, 4.2, and 4.3.

Parks and Recreation

General: All figures that illustrate "Segment 6: West Seattle" appear to be incorrect: the alignment of 6.1 and 6.2 to the west of the Delridge stations appears to be incorrectly shown and labeled. Alignment 6.2 should be paired with Delridge 2 and so forth. This mistake appears throughout the document and engenders a great deal of confusion. As a result, all references in the EIS to alignment alternative numbering in West Seattle and all comments here related to alignment alternative numbering in West Seattle should be carefully reviewed for accuracy.

4-298 Table 4.10-1 Several names on this list should be corrected: "Westlake Square" rather than "Westlake Park" "West Duwamish Greenbelt" rather than "West Duwamish and Pigeon Point Greenbelt" "Longfellow Creek Greenspace – Yancy" rather than "Longfellow Creek Green Space – Yancy." These names should be corrected throughout the document.

4-298 A better way to refer to the Longfellow Creek Greenspace in Table 4.10-1 is to describe it

as "Longfellow Creek Greenspace at Yancy"

4-299 Table 4-10-2 Correction to implementation status of The Longfellow Creek Legacy Trail - the Legacy Trail is not complete. The Pro Parks Levy funds additional elements. The City continues to identify and implement key actions to develop remaining segments of the Legacy Trail Plan in coordination with the Delridge and Westwood Neighborhood Plans.

4-302 Refer to the greenspace as "Longfellow Creek Greenspace at Yancy." Also, the creek actually flows through a number of greenspaces and parks including the West Seattle Golf Course.

4-302 The Dragonfly Pavilion is planned to be located at 28th Ave SW and SW Dakota Streets in the upland area of the greenspace, not in the creek and buffer area.

4-302 Section 4.10.1.6 Longfellow Creek Greenspace paragraph: Seattle Public Utilities has invested over $4 million in restoration of the creek at this site, along with help from volunteers in the community. In 1999 and 2000, the utility carried out a large-scale restoration project in Longfellow Creek between SW Yancy St. and SW Genesee. Approximately 1,000 feet of creek was enhanced.

4-302 Section 4.10.1.6 Longfellow Creek Greenspace paragraph: The "community effort" identified in this paragraph has taken place over a span of 15 years and has included numerous local organizations and funding from many local businesses.

4-302 "Section 4.10.1.6 Longfellow Creek Greenspace paragraph: Please change the comment "There has been a community effort to improve the stream (Longfellow) for several years, including yearly fish releases conducted by local schools....." to: "There has been a community effort to improve the stream for several years, which included, among other efforts, yearly fish releases conducted by local schools between 1990 and 1999. Schools stopped releasing fish in 1999, to make it easier to assess natural salmonid production in Longfellow Creek. To this end, SPU has been conducting weekly salmon spawning surveys each fall since 1999, and lismolt trapping for 9 to 12 days each spring since 2001. (Katherine Lynch, Urban Creeks Biologist, SPU, personal communication)"

4-302 Refer to the greenspace as "Longfellow Creek Greenspace at Yancy." Also, the creek actually flows through a number of greenspaces and parks including the West Seattle Golf Course.

4-302 The Dragonfly Pavilion is planned to be located at 28th Ave SW and SW Dakota Streets in the upland area of the greenspace, not in the creek and buffer area.

4-305 Fifth and seventh paragraphs. Since impacts to Longfellow Creek Green Space are noted on page 4-307 as "significant unavoidable adverse impacts", the assessment on page 305 should be consistent and also indicate this degree of impact.

4-305 and other pages. It in unclear from references in the DEIS as to whether a new park or open space is proposed for the western portion of the Sinking Ship Garage site (Yesler 1 Station). (See 4-211, 2nd paragraph; 4-305, 1st paragraph; Figure M-66a; Figure M-66b; and 4-338, 6th paragraph.) It is unclear to what degree this would be considered parkland and come under the jurisdiction of the Seattle Parks Department. Please clarify.

4-302 & 4-303 Section 4.10.1.6: correction: The West Seattle Segment area has 4 existing parks and 3 designated Greenspaces. City Resolution 28653 (1993), Open Spaces Policy, designated (in the segment under discussion) the West Duwamish Greenbelt (includes Pigeon Point), the Longfellow Creek Greenspace, and the Eddy Street Ravine.

4-305 & 4-306 Section 4.10.2.1 Long-Term Impacts - Longfellow Creek Greenspace, West Seattle Golf Course & Camp Long: The choice of the Dragonfly Pavilion as a reference area for impacts to the site seems inappropriate in that it is not yet built (although once constructed it will be an additional focal area for educational groupings); the Greenspace from SW Yancy to SW Genesee Streets is 5.65 acres, a significant area and the beginning of the " green corridor" through the Delridge Valley which includes the Golf course, Camp Long and other Greenspaces (total of 30acres) along Longfellow Creek.

Cultural Resources

General/Areaways (1) In the descriptions of Yesler 1 (West) station on page 4-338, N-191, N-207, N-208, and N-211, the demolition of the Sinking Ship Garage (also known as the 2nd & James Garage) is described but there is no mention of the impact to the areaway that shares a party wall. The lack of areaway inclusion is further reinforced on page 4-502 in the statement that construction impact from demolition of existing structures would not exceed 95VdB. This statement does not account for the demolition of the Sinking Ship Garage that shares a party wall with the Sinking Ship areaway.

(2) The areaways are initially consolidated under one heading (D-127) on pages 4-324 and N-190, and on pages 4-322 and N-190. In these instances they are listed as NRHP eligible. Then on page N-173, D-127 is identified only as the Sinking Ship areaway site and as ineligible for the NRHP. Furthermore, no preliminary evaluation of effect was done for the areaways in Table N-2.

The areaways are identified in the archaeological section of the DEIS as having been surveyed; however, no determination is made in the archaeological section as to their eligibility, nor are these surveys referenced in the eligibility determinations made in the historical resources sections. The letter of August 7, 2003 from Allyson Brooks, State Historic Preservation Officer, to Kimberly Demuth, Senior Consultant with Entrix, Inc., finds that the Sinking Ship areaway is not eligible for listing in the NRHP under criterion D (i.e., archaeology). However, in the Pioneer Square Historic District Areaways Hazard Mitigation Study prepared by the City of Seattle Department of Transportation, Sheridan Consulting Group and Parsons Brinckerhoff (March

2003), the Sinking Ship areaway [page N-345, SDOT #601, PSHD #76, 515 2nd] rated a one on a scale of one to four with one being the most historically intact and significant. Another letter from Allyson Brooks to Kimberly Demuth on August 7, 2003 finds that the areaways are eligible for listing in the NRHP under criterion A (i.e. historical significance).

(3) With regards to construction impact, the areaways are included under the 95VdB "extremely fragile" level (pages 4-334, 4-534, N-195), then in Table 4.17-6 (pages 4-507 through 4-510) and Table N-3, pages N-200 through N-202, the areaways are identified as 100VdB "sensitive" rather than 95VdB "very sensitive."

In addition, pages 4-325, 4-333, 4-337 and N-207 state that areaways would be affected by vibration during operation or construction, although not adversely affected. On page N-8, it states that the Green Line would have an effect but no adverse effect on one historical resource; it actually would have no effect on seven historical resources. These statements do not account for the Sinking Ship areaway and other areaways along the Second Avenue Extension South that are potentially in immediate proximity to the Green Line foundations as indicated in Appendix X (fig. 2 stage 1; fig. 4 stage 2; fig. 6 stage 3; fig. 12 stage 6; fig. 16 stage 8) and the demolition of the Sinking Ship Garage."

4-321 and 4-322 Table 4.11-1: D-79 - D- 127 are also listed in the local Pioneer Square Preservation District (PSPD) and should be acknowledged as such on the table.

4-323 Segment 4: Downtown Segment, 2nd paragraph: When referring to the Pike Place Market, the National Register listing is the "Pike Place Public Market Historic District" and the local district is formally the "Pike Place Market Historical District." The local district is larger than the National Register district; therefore, the statement: "The local Pike Place Preservation District shares similar boundaries" is incorrect. Please revise in text and in Appendix N.

4-337 Change language from "may" to "will" block views of significant architectural details….and "could" to "will" block views of the decorative belt coursing located above the second story…

4-338 Madison 1 (west) add: demolition of the Federal Reserve Building would cause an adverse visual affect due to loss of visual fabric and change to visual context of adjacent historical resources.

4-341 4.11.4 Memorandum of Understanding: should be Agreement instead.

4-343 Segment 4 Downtown Segment: change language "could" to "will" block views of the decorative belt coursing…

4-344 Section 4.11.5.2 change language "could" to "will" have a significant unavoidable adverse impact by altering the character…"

Environmental Health

The document would be improved by specifying a method of releasing information about the environmental performance and discoveries that occurs throughout the project. The communications methodology shall provide the reader and/or interested party with a verifiable system under which the environmental knowledge is distributed, beyond a need-to-know basis.

The section does not acknowledge that contamination interactions will increase costs, create service disruptions, and add time delays. This information should be added in the FEIS.

Specifics on handling and management of process waste waters and storm runoff were not presented in this section. This should be added in the FEIS.

4-354 Section 4.12.4.2: It is well stated in the last sentence of the first paragraph that "releases to groundwater probably have the greatest potential to affect construction activities because of the high potential for the contamination to migrate." However, the discussion of this issue dealing with contaminated soils has been very difficult to follow in the DEIS as the information is scattered throughout various sections without clear direction on where to find information. For example, on page 4-453 the reader is directed Section 4.17, Construction which is over 93 pages long.

Earth

The references by Shannon & Wilson, the geotechnical consultant, should have been available in the DEIS appendix as essential supporting information. It should be included in the final EIS document.

Reference of "Griswold, 2003" is not an appropriate reference in any of the 5 citations in the EARTH section. Information informally given should have been verified by the SMP prior to inclusion in the DEIS.

4-379 4.13.1.3 Analysis of the Segments and Alignment Alternatives; Segment 2: Interbay Segment. See last paragraph in this segment. Landfill areas and the area within 1000 feet of a methane-producing landfill are mapped in the City mapping system. If these are to be considered geologic hazard areas for purpose of this EIS, its mapping unit should be acknowledged, along with the other geologic hazard areas cited in this section.

Water

4-390 The impacts are not determined based on the change in impervious surface but on the disturbance of 1 or more acre or the addition or replacement of 5,000 square feet of impervious surface per SMC 22.800.

4-391 The DEIS analysis of the requirements of Seattle's Stormwater, Grading and Drainage Control Code is not accurate. The project will be required to mitigate for new and replaced impervious surface not the net change of impervious surface.

4-392 Sec. 4.14.4.1, 2nd paragraph, last sentence: Change last sentence to: "The Green Line would not affect these special conditions."

4.398 Table 4.14-1: References are not included in App. H. Convert PCBs and TAT to mg/kg dry weight to make it easier for people to compare concentrations with those in Table 4.14-2.

4.399 Table 4.14-2: Please provide the reference(s) for the samples in the table.

4.399 Lake Union: It should be mentioned that Lake Union supports an important salmon migratory route.

4.400 Duwamish River: It should be mentioned that the Duwamish River supports an important salmon migratory route.

4.400 Longfellow Creek, 2nd paragraph: references cited are not included in App. H

4-400 In Section 4.14.4.1 Receiving Water Bodies - Longfellow Creek, the statement beginning "Because the Longfellow Creek basin has been developed, ..." is incorrect. There are over 100 acres (30 acres of open space in addition to 68 acres of Camp Long and additional acreage of the Golf Course (~15 acres) in the Delridge Valley) of undeveloped land in the basin.

4-403 3rd paragraph, 1st sentence: Change "could" to "would" in reference to increased stormwater discharges to the combined system, if unmitigated.

4-403 4th paragraph, 1st sentence: Change "could" to "would" in reference to the impact the stations and the operations center would have on water quality if not mitigated.

4-403 5th paragraph, 1st sentence: Change "could" to "would" in reference to industrial activities at the Operations Center.

4-403 5th paragraph, 2nd sentence: Change "could" to "would" in reference to sources of pollution resulting from station sites, pick-up and drop-off areas.

4-405 Table 4.14-3. Column headings are not consistent with the rest of the tables showing PGIS'. Use the same headings as in the other tables. Please clarify why only the bolded numbers are included in the total. It says that it's because some alignment alternatives also contain station alternatives...this table only shows station alternatives.

4-405 through 411 PGIS tables: Is the project converting the difference between the existing PGIS and the proposed PGIS into NPGIS?

4-407 1st paragraph, 3rd sentence: Please provide back up information justifying the certainty of an improvement in the runoff quality if the station sites were constructed.

4-410 The project must comply with the City's drainage code and provide water quality treatment based on the square footage of disturbed surfaces, not on trade-offs or offsetting of pollutants in one area for another.

4-411 Table 4.14-11: Please cite reference to the Potential to Impact Surface Water for standard truck tires and standard truck brakes.

4-413 4th paragraph, 5th sentence: DEIS states that "The amount of pollutants released from the monorail brakes and tires is anticipated to be considerably less than from buses." Per Table 4.1-11, there'll be an increase in bus/monorail average operating hours by 2020 compared to No Action. Please explain why the statement is anticipated to be true.

4-413 3rd paragraph, 1st & 2nd sentences: Change "could" to "would" in both sentences. Last sentence: pollutants from the project must be mitigated, regardless of whether the amount would increase the existing concentrations in the water body above toxic levels.

4-414 1st paragraph, 2nd to last sentence: The statement that the effect on the water quality of receiving waters would be similar for any of the alternatives ignores the fact that Longfellow Creek is much more sensitive to the introduction of pollutants and water quantity, that the Duwamish River is an estuary and that the Ship Canal is on a fresh water lake. Each of these water bodies and the wildlife and aquatic life they support responds differently to stormwater pollutants.

4-414 3rd par, 2nd sentence: Please justify (cite water quality studies) the statement that the Green Line could result in positive impacts to water quality when the project is predicted to

reduce overall vehicular traffic by only 1.1% by 2010. That percentage is well within the variance of water quality testing results for all the waterbodies this project affects. If this project is required to construct a new outfall, it is the City's experience that this takes a significant amount of time and resources to design and acquire permits from various agencies. The City will require a drainage plan to be developed showing the discharge location during the design phase.

4-415 1st paragraph, 3rd sentence: Change "could" to "would". This project is required to comply with the City's stormwater code.

4-418 Table 4.14-17: Do the Estimated Facility Volumes for Delridge 1 and 2 include the amount for enhanced water quality treatment?

4-418 Off-site Access. Without describing the location and size of these off-site access areas no determination of significance can be made.

4-418 1st paragraph: If the off-site pick-up/drop-off areas and bus layover areas are redeveloped and trigger the drainage code, these areas will require mitigation.

4-419 3rd paragraph, 2nd sentence: The reduction of vehicular trips does not impact the need to mitigate the impacts the project will have on water quality due to its operational or construction activities. Please include a discussion about the future removal, replacement or repair of the in-water bridge supports and the associated impacts to water quality.

4-419 5th paragraph, 1st sentence: Determining the water quality thresholds for the project as a whole or in parts will need to be discussed with the City, since the project doesn't just drain to one water body.

4-419 & 4-431 Is there any relationship between pollution generating impervious surfaces (PGIS) and effective impervious surface? Why would PGIS decrease (Table 4.14-8) while effective impervious surface would increase (Table 4.14-24)?

4-420 last paragraph, last sentence: Add ", streets or buildings" after "…raw sewage into receiving water bodies"

4-420 Last Paragraph 4.14.2.3, 4th paragraph, 4th sentence: Include information on additional impacts caused by new impervious surfaces draining to the storm system. These additional impacts include increase velocities, erosion, sedimentation, and turbidity, and increased stream temperatures in the summer.

4-421 2nd bullet, 1st sentence: The requirement that a storm system be present in order for pollutants to negatively affect water quality needs to be substantiated. Sheet flow into a water body from adjacent developed property can and does contribute to water quality degradation of that water body.

4-421 Non-effective Impervious Surface: The determination that columns and guideways will not be considered effective impervious surfaces because there presence will not increase the rate or volume of stormwater runoff to the receiving system above existing conditions is not accurate. These structures may change the rate and concentration of stormwater flow therefore may impact the CSOs and other discharge points. An analysis of the rate and concentration of stormwater flow from these structures is required to determine the impacts of this change on CSOs and other stormwater discharge points. Mitigation should be identified for these impacts.

4-421 The footprint of the columns will be considered impervious surface.

4-421, 4-439 4.14.2.3 Surface Water Quantity Impacts, Paragraphs on Effective & Non-Effective Impervious surface and 4.14.4 Mitigation. Analysis of the impacts of dewatering activities and mitigation measures is not adequate. Non-effective impervious surfaces compared to effective impervious surface still generate runoff, but at a reduced rate; therefore, runoff contribution from these surfaces to existing drainage channels or conveyance system must be accounted for in the capacity analysis using a conservative method.

4-421 2nd paragraph, 1st sentence: Add "as defined by the Department of Ecology" after "...can be divided into two categories". Also, the City's drainage code is not based on Ecology's definitions of effective impervious surfaces and non-effective impervious surfaces and does not use them to determine what areas require mitigation. (Also applies to 2nd bullet, 2nd paragraph; page 4.425. 5th paragraph, 3rd sentence.)

4-421 1st bullet, last sentence: Comment: Statement is true but the City's drainage code is not based on what components are hydrologically important or not. Please refer to the Code for triggering conditions.

4-421 Last paragraph, last sentence: A number of studies have shown that water quality degradation occurs when there's as little as 10-15% development in a watershed.

4-423 Provide calculation of how Alternative 4.2 will have a 4 percent increase in impervious surface.

4-424 and 425 6th Paragraph. Longfellow Creek requires a 50-ft buffer in which no development is allowed. Exceptions to this requirement are not as described. Refer to SMC 25.09.

4-425 Last paragraph: Comment: If this project is required to construct a new drainage outfall, it is the City's experience that this takes a significant amount of time and resources to design and acquire permits from various agencies. The City will require a drainage plan to be developed showing the discharge location during the design phase.

4-427 through 432 Tables 4.14-9 through 25 Why are the bolded stations not the same as those in Tables 4.14-3 through 8?

4-433 5th bullet: Add "City" after "..designated receiving water may be exempt from ". Ecology may impose detention requirements.

4-434 5th paragraph, 1st sentence: Shouldn't it read "..could provide a water quantity (not quality) benefit…"? Not sure why the examples of WSDOT's HPA permits were included.

4-434 First and Second Bulleted Paragraphs: If the project has 5,000 square feet or more of new or 1 acre of accumulated new and replaced (down to the earth) impervious surface, stormwater treatment may be required regardless even if it drains to a designated receiving water body depending on the impacts. (See General Comment #3). Credits and net amount of impervious surfaces are not allowed in determining whether water quality treatments will be required. If the project has 2,000 square feet of new and/or replaced (removed down to earth) impervious surface, then detention will be required even if it discharges to a combined system. The impervious surface created by the total project will be used when determining the stormwater requirements.

4-439 1st paragraph, 2nd sentence: Depending on where the discharge point(s) are, there may or may not be adverse impacts. For example, if the bridge deck generates pollutants that

are washed into the receiving water bodies, there may be adverse impacts. Again, the City's code is not based on Ecology's definitions of Effective and Non-Effective impervious surfaces. The project shall comply with the City's code.

4-439 4.14.7. Given outstanding questions related to the impacts of pollutant runoff from the bridge crossings, it is premature to make a SEPA determination of significance regarding water quality impacts. The City will need to examine additional data requested in the above comments before agreeing with whether or not there is a significant adverse impact.

4-440 4.15.1 Longfellow Creek: Description inadequate and incorrect. The reference to the Dragonfly Pavilion, not yet built, as a landmark and geographic locator should be replaced with an existing landmark. The document should state that this is a 5.65 acre Greenspace with riparian and upland areas from SW Andover to SW Genesee.

4-450 There are 2 Zelcova serrata trees on the Seattle Center campus and none of them would be near any of the monorail proposed routes through the campus.

4-453 3rd Paragraph. The sentence regarding the observed eagles perched on the large Sequoias should be attributed to Seattle Center Staff, not Glowacki.

4-459 It should be noted that moving trees is an expensive mitigation option. Based on recent Seattle Center experience, the cost of moving a 6"-8" caliper tree within the Seattle Center grounds is between $500 - $800. Trees that are 8" - 15" caliper cost from $800 - $5000 to move. Trees 16" - 18" are $5000 - $10,000 per tree. A tree over 20" in caliper would be a minimum of $20,000 and potentially much more.

4-458 Many sq. ft of shrub beds, ground covers and lawns, as well as trees will be removed or impacted primarily by the 3.1 route. The cost of replacing these plantings is significant. For example, the cost of planting a 10'x10' area from the ground up with shrubs , perennials and ground covers can easily cost up to $1000 just for plants and labor. This assumes that the infrastructure, such as soil, irrigation system, landscape rocks, etc is still in place. If the infrastructure has been demolished then the cost will be much higher. The cost of replacing lawn is .35 per sq. ft. Any lawn area impacted by construction should be protected if possible and/or replaced after construction at cost to the contractor or project.

Plants & Animals

General All figures that illustrate "Segment 6: West Seattle" appear to be incorrect: the alignment of 6.1 and 6.2 to the west of the Delridge stations appears to be incorrectly shown and labeled. Alignment 6.2 should be paired with Delridge 2 and so forth. This mistake appears throughout the document and engenders a great deal of confusion. As a result, all references in the EIS to alignment alternative numbering in West Seattle and all comments here related to alignment alternative numbering in West Seattle should be carefully reviewed for accuracy.

4-440 2nd Paragraph. See comments in water section regarding potential significant impacts of pollutants to the aquatic environment.

4-441 4.15.1.1 Second and Third Paragraphs. Include adult salmonids as fish that use the aquatic habitats.

4-442 2nd Paragraph. Include the reference for this information

4-444 2nd Paragraph. Include that the Duwamish River is also an important route for adult salmon.

4-444 6th Paragraph. Include the name of the fish biologist.

4-444 6th Paragraph. Include reference for information on the absence of forage fish spawning habitat.

4-446 Last sentence of second paragraph: The following "land use in the segment between the culvert intake at SW Andover and SW Genesee Streets is predominantly scattered residential and industrial" is misleading. It does not recognize the existence of a 5.65 acre open space area.

4-446 Third Paragraph: Correction: Although Seattle Public Utilities (SPU) did not begin conducting formal spawning surveys in Longfellow Creek until 1999, approximately 44 adult Coho salmon (live and dead) were observed in the creek downstream of SW Genesee Street. Spawning surveys conducted by Washington Trout under contract to SPU resulted in the following counts of adult Coho carcasses: 92 in 1999, 282 in 2000, 270 in 2001, and 166 in 2002, and in the following counts of adult chum carcasses: 67 in 2001 and 21 in 2002 (Katherine Lynch, Urban Creeks Biologist, SPU, personal communication). Comparisons of daily and weekly spawning survey counts have demonstrated that some of carcasses are overlooked and thus the creek likely has counts of substantially more fish.

4-447 There is one Sequoia sempervirons and one Metasequoia glyptostroboides north of Key Arena near Mercer St. that have been observed as eagle perches by Seattle Center staff.

4-448 Table 4.15-4. Include status of the species according to WDFW Priority Habitat and Species information.

4-449 1st Paragraph. Provide source for the wetlands information.

4-452 Endangered Species Act Listed Species Section. Addition. There has been a record of one redd produced by a spawning pair of Chinook in Longfellow Creek in 2001 (Katherine Lynch, Urban Creeks Biologist, SPU, personal communication).

4-454 4.15.2.1 Operation Impacts, 3rd Sentence. The monorail will be contributing heavy metals, hydrocarbons and grease into the environment therefore it shouldn't be classified as a non-pollutant-generating mode of transportation.

4-456 Operational impacts at Seattle Center may include extensive cleaning and bird control measures under the guideways if these structures have roosting potential for birds such as pigeons. Given this, potential mitigation measures could include installation of acceptable bird repellents and financial contributions towards the cost of cleaning.

4-456 Section 4.15.3.3 last paragraph on page. "Operation of the Green Line Alternative 6.1.2 would require control of the vegetation height under the guideway". However, it would also require removal of some trees during construction (assuming all vegetation within 50 feet on either side of the Green Line alignment centerline would be removed by construction.) This is not addressed.

4-457 4.15.3 Mitigation. Change "may" to "will" in first sentence and remove "likely" from the 3rd sentence.

4-457 4.15.3.1. Change "could" to "would" in first sentence and remove "minor" from last sentence. The impacts of the structures has a good potential to be significant because of the increase in bass habitat which can lead to an increase in predation on juvenile Chinook salmon.

4-457 States "Assuming all vegetation within 50 feet on either side of the Green Line alignment centerline would be removed by construction activities…." Does this apply along entire line? If so, are more trees likely to be removed or pruned?

4-459 4.15.4. Significant Unavoidable Adverse Impacts are likely to occur from the permanent structures that are proposed in the Ship Canal. This is a highly degraded environment with anadromous fish that use this area as a migration route to and from their spawning habitat. An increase in habitat for predator species of these anadromous fish can be considered significant. A more detailed analysis of these impacts will be needed

Cumulative Impacts

4-464 1st full paragraph. The Weller/King Street Station example cited in this paragraph does not exhibit lost parking supply/increased parking demand discussed earlier in the paragraph. This should be clarified.

4-464 The example of Westlake Station and Weller Street Station in the first full paragraph only illustrates increased pedestrian activity, not the other cumulative impacts discussed earlier in the paragraph. This should be clarified.

4-464 The Alaskan Way Viaduct and Seawall Project might displace 500-700 on-street parking stalls, which is more than "some parking". The Downtown monorail segment has identified on-street parking losses within a range of 122-236 spaces (along 2nd Ave and Stewart St). Cumulatively, this is a significant impact (in fact, the Transportation Section determined this to be a Significant Unavoidable Impact) from both parking capacity and city revenue perspectives.

4-465 Statement is made that cumulative land use impacts are not expected in West Seattle because of the relatively small number of projects planned for that segment. However, on page 464, mention is made of a substantial number of private development projects in West Seattle as potentially leading to "impacts from higher ridership." Please clarify.

4-469 Cumulative Impacts of No Action Alternative: The discussion of the No Action Alternative's impact on achievement of the regional growth strategy should focus on impacts to the neighborhoods served by the Green Line and the region's connections to/from those neighborhoods, since other funded public transportation projects serve other areas of the region.

Construction

General Sidewalk widening along the route must comply with ADAAG slopes, and City of Seattle standards, typically 2%. This has elevation impacts to private properties and/or drainage function impacts.

General Please note that new utilities have been installed along several streets along the alignment that do not show up in "underground utility drawings for all EIS alternatives", dated June 12, 2003.

4-471 2nd paragraph: "where 24 hour construction…additional conditions or permitting requirements could apply" Change "could" to "would."

4-473 Seattle Center has an extensive irrigation system that will be impacted by any of the routes going through the campus. Virtually all landscaped areas and lawns are served by an in-ground automated centrally controlled system (Maxicom). Double-check valves, zone valves, mainline and lateral pipes, sprinkler heads, valve wires and the Maxicom communication wire must be protected in place or relocated if they fall within the construction zone. If construction is to occur during the growing season, irrigation must be kept operational adjacent to the construction zone.

4-473 "Stage 1 – Move Utilities and Clear Foundation Sites
The DEIS states that "Utilities that encroach on the utility clearance requirements would be relocated underground or to an overhead location elsewhere in the right-of-way." Replace with: "In areas where the monorail structure will encroach on the required clearance to a utility, the utility shall be relocated underground, vertically in the location, or re-aligned in the same right-of-way."

4-474 Stages 2, 3, and 4 – Column Foundations
Hand digging and vac-truck may be required next to 14.4 kV network ducts and vaults, until the facilities have been passed.

4-474 Stages 2, 3, and 4 - column foundations: There is no mitigation proposed for erosion from auger spoils that will be temporarily deposited on the surface during construction especially during the wet weather season.

4-474 "Pile driving would be a source of noise and vibration…" Further information is required on the effect of vibration on existing utilities and structures before approval of pile driving is given. Please provide information on the specific amount of vibration that is expected, its affect on utilities and structures.

4-476 "Stage 6 – Guideway Beam Installation
The guide beam should maintain clearance from overhead power during installation. Lay-down plans shall be put in place that shows the sequence of work to show that it is possible to position the beam without violating construction clearances."

4-478 4.17.1.5 Bridge drains will be an issue depending on track location. Downspouts may have to be retrofitted with Catch Basins or other BMPs.

4-479 Some of the existing trees have very high historic and monetary value to the neighborhood. The impact of tree removal needs to be discussed further. SMP must consider other mitigation that would allow for protecting the trees during construction.

4-482 The DEIS states "In Downtown Seattle, SMP will coordinate with the City of Seattle on special events, holiday construction, and other activities." It should state, "In Downtown Seattle, and around the Seattle Center…"

4-482 There are no mitigation measures listed at the end of table 4.17-2 regarding impacts from listed construction sequencing, installation of columns and temporary use of staging areas.

4-485 Discussion of impacts should include impacts to pedestrian movements on Seattle Center campus with Alts 3.1 and 3.3.

4-485 There is no mention of the construction impacts of demolition of the existing monorail.

4-485 Segment 3, paragraph 1, remove "heavy" and replace with "within the ROW", and change "hour" to "hours". This is a global comment for all segments.

4-487 Text indicates closed travel lanes in the area of the West Seattle Stadium. These impacts to access should be identified here.

4-489 Bullet 13 - SMP should commit to "identify and implement" measures to reduce the need of street parking by construction workers ..."

4-488-490, 4-496, 4-500 4.17.2.2 Detailed Construction Management Plan (CMP), to schedule monthly meetings for the duration of the project. Attendees: SMP, all pertinent city agencies, contractor and the neighborhood. Have a "construction" telephone hotline with a live person answering calls, newsletter with construction schedule for upcoming month. CMP would be for all construction mitigation sections. (Also applies to p. 4-496, 4.17.5.2 and page 4-500 4.17.8.1.)

4-489 Ordinance 119975 (the Sound Transit Transitway agreement) contains a number of construction mitigation items that should be implemented by SMP as well. Among those items are: "developing a multi-media public information program to provide information regarding street closures, hours of construction, business access, and parking impacts; working with affected business owners, chambers of commerce, merchants associations and others to develop a business-marketing program to minimize business disruption during construction. The program could include a shuttle bus and/or increased transit service to affected areas, additional signage, advertising and promotion, and incentives to attract and retain customers."

4-489 Last line. Change "6:30 AM" to "6:00 AM"

4-494 The DEIS states "Construction timing for both through Seattle Center alternatives (3.1 and 3.3) is a concern because of the many performance venues in the Center." It should be "Construction timing for all Seattle Center alternatives…"

4-495 4.17.5.1: Economics - Impacts: (end of first paragraph under impacts) Please state positively whether mitigation of the loss of parking will be needed and will be provided.

4-495 4.17.5.1: Impacts, second paragraph: Please provide more specificity about potential loss of jobs and revenue to local businesses.

4-496 4.17.5.2: Please either state mitigation in positive terms (change "could" to would) or identify the impacts as not able to be addressed by mitigation.

4-496 The DEIS mentions a shuttle bus as potential mitigation; the FEIS should identify specific mitigation measures proposed to address the interim period when no monorail service is operational along the current route.

4-496 4.17.4: There is no mention of responsible party for permit negotiations such as NPDES construction permits that may be required for some sites in the mitigation section.

4-498 Are there any sensitive air quality receptors located near construction sites?

4-498 Potential impacts associated with changes in traffic patterns and how it affects air quality due to construction needs to be analyzed especially on heavily congested intersections and roadways.

4-498 Need to discuss how vehicular emissions and fugitive dust effect human health.

4-500 4.17.8.2 Vibration Impacts and Mitigation; Impacts. Bottom of page. The document states that at the highest level, buildings respond to vibration with slight damage. "Slight damage" is not defined. Significant damage can occur to structures from construction related impacts, including structural damage, and architectural damage to finishes. Historic and older landmark structures are even more sensitive. Much lower vibration levels will cause extensive damage to these sensitive structures than newer structures. The EIS should indicate that significant foundation and architectural damage can occur due to construction- related vibration, and these adverse impacts must be mitigated.

4-500 Section 4.17.8.2; Other non-building structures should be added as another category. Older lead joint watermains and clay sewer pipes can develop leaks or cracks from excessive vibration. Watermains and sewers supported by pile foundations in poor soil areas can settle and shift due to excessive vibrations. These impacts were not addressed in the vibration section.

4-500 4.17.8.2 Soil test borings collected for SMP should be reviewed for subsurface conditions, once the study by Shannon and Wilson is completed and available. A case-by-case review of vibration sensitive structures should be conducted using the results of the soils report. This requirement should be included in the text of the DEIS.

4-501 4.17.8.2 Vibration Impacts and Mitigation; Impacts. Middle of page. What is the reference for damage threshold for fragile buildings? One useful reference concerning this issue is "Vibration Criteria for Historic Buildings," by Walter Konon and John R. Schuring, ASCE, 1983. This reference includes a damage threshold relationship between peak particle velocity in inches/second as related to frequency in Hz. The damage threshold for frequencies up to 10 Hz for transient vibrations (like an impact pile hammer) is as low as 0.25 inches per second. The damage threshold for steady state vibrations (like a vibratory hammer) is 0.12 inches per second for the low frequencies. Higher frequencies associated with vibratory hammers have a damage vibration threshold ranging from 0.12 inches per second to 0.25 inches per second. Vibration values no higher than these should be the limiting values in the EIS, based on the results of this study.

4-501 Vibration levels related to construction activity are discussed in the DEIS in units of RMS velocity levels in VdB re 1 micro inch/sec. The EIS needs to provide a conversion between this unit and the commonly used unit of "inches/second" with which vibration is often measured in terms of peak particle velocity. Without a conversion, or a supporting appendix, it is difficult to navigate this section and the numbers are not meaningful.

4-501 4.17.8.2 Vibration Impacts and Mitigation; Impacts. Last paragraph. The DEIS does not indicate that the vibration damage threshold for steady state vibrations such as generated from a vibratory pile hammer is less than for transient vibration such as for an impact hammer.

4-501 4.17.8.2 Vibration Impacts and Mitigation; Impacts. Table 4.17-5. The source of these values for various construction equipment is not provided or referenced.

4-502 4.17.8.2 Vibration Impacts and Mitigation; Mitigation. 2nd paragraph. The DEIS indicated that "...a vibration monitoring program could be implemented for all activities that produce vibration levels at or above 0.5 inch per second wherever there are sensitive structures located closer than 25 feet from the construction activity." The vibration level specified may not be sufficient to prevent adverse impacts to an historic structure. Vibration levels as low as 0.12 inches per second could result in damage.

4-502 4.17.8.2 Vibration Impacts and Mitigation; Impacts. Second to last paragraph in this section. The DEIS does not indicate that damage to utilities, including cumulative impacts through the years, is difficult to assess and hard to detect since they are buried and cannot be easily visually inspected. It is not clear what the document refers to as "vibration impact damage." As a mitigation option SMP must document existing conditions of sensitive utilities prior to start of work within zone of influence.

4-511 4.17.8.2 Vibration Impacts and Mitigation; Mitigation. The DEIS indicates that "If the use of pile driving is necessary near very sensitive buildings, additional soils information and vibration testimony could be gathered to establish the site-specific estimate of vibration levels." It is not clear why pile driving would be necessary in close proximity to very sensitive buildings. This paragraph also indicates that vibratory hammers should be considered where vibration levels are near damage thresholds; however, no distinction is made to lower damage threshold associated with vibratory hammers. Also, other construction equipment capable of generating significant vibrations, such as hoepacks, were not mentioned.

4-511 4.17-6 The second paragraph on this page has a list of possible mitigation measures for vibration during various activities; none mentioned the removal and demolition of concrete pavement with "hoe rams" or other types of impact equipment. Since there is no data from core samples, it would be difficult to know how thick the paved area is and what level of vibration will occur when the demolition takes place.

4-511 4-17.10.2 Vibration mitigation measures - Add pre-drill driven piles in compact "crust" over soft soil.

4-512 4.17.10 general - SPU is responsible for the Heath and Safety of the water system as it related to public health as mandated by City ordinance and Washington State Department of Health. The contractor shall not damage, repair, alter, dismantle or operate any SPU owned water mains, services, valves or hydrants. This includes water services, fire services and hydrants. If any portion of the water utility is damaged construction, call the 24 hour dispatch line at 206-386-1800. Contractor shall not operate or perform repairs to the SPU owned water system.

4-512 4.17.10.2 - First paragraph - second sentence comment - Exact locations and depths of utilities shall be verified by SMP. Impacts to SPU facilities and associated costs will be verified by SPU based on SMP supplied plans and supplemented information during the design stage.

4-513 4.17.10.2 First paragraph - third sentence should be modified to say: "During the final design phase, construction methods and BMP would be developed by SMP and the DBOM contractor in consultation with and final acceptance of the utility purveyors. Waiting for the final design to determine construction methods could delay the project if incorrectly designed. The specific utility approved plan shall take into account spacing and protections measures specific to each site to reduce customer outages and prevent lack of access, damage to facilities, settlement, vibration over threshold, and avoid dewatering groundwater and hazardous materials."

4-513 4.17.10.2 Third paragraph - fourth sentence "All underground utility relocations share…" add the word "vibration." In addition, the ripple effect by moving other impacted utilities needs to be included.

4-513 4.17.10.2 Fourth paragraph - third sentence. Add bold text as follows: "Determination of acceptable new locations of SPU facilities shall be coordinated with and approved by SPU."

4-513 4.17.10.2 Fourth paragraph - sixth sentence should be modified to read "Trenches over four feet in depth required shoring to ensure working safety per Washington Industrial Safety and Health Act regulations and shall be designed to protect utilities within the zone of influence.

4-514 Table 4.17-8 general note 5 - Where watermains are replaced or relocated it is very likely that water services, hydrants and appurtenances will also need to be replaced or relocated. In addition additional appurtenances such as hydrants or water services may be need to be relocated due to conflict.

4-514 Table 4.17-8 general note 6 - fire hydrant and service location may also be affected by column placement.

4-514 Table 4.17-8 General comments: The potential impacts of the project lengths and services affected were not verified. The actual length and number of services affected will be determined when actual plans for alignment and column placement are developed. Also, this table does not take into account the possibility of utilities being affected by the "ripple affect" by other utilities moving into the vicinity.

4-517 First paragraph - second sentence "in some cases…." The DBOM contractor shall not "damage, repair, alter, dismantle, modify, or operate any SPU water facilities. In the event of damage call the 24 hour dispatch line at 206-386-1800.

4-517 Repeat - First paragraph - fifth sentence should be modified to read "The relocation would be reviewed and approved by the utility purveyor…"

4-517 Repeat with modification - First sentence "Existing underground utility service connections……" Extending or shortening the underground utility service may not always be feasible to retain a connection to the relocated main, specially for gravity-only utilities. For the water system, the existing material would be factored in. Only a perpendicular straight line is allowed from the water appurtenance to the watermain. If a new watermain is installed, the existing services would not be reused.

4-530 Typical Potential Mitigation Measures, second bullet. Change to read "Continue to meet with and coordinate closely with both municipal and private utilities to reduce impacts. As part of long range planning, develop a plan for relocation and construction sequencing acceptable to the utilities and design protection of their facilities into the column foundation design that will allow the utility to access to adjacent facilities. Note: if utility relocation requires a service connection to move - It is SMP's responsibility to coordinate any service connections on the private portion of the utility being moved with the private property owner. SPU will not work on the private portion of any utility service. Before any relocation, SPU will verify this coordination has taken place between SMP and the private property owner.

4-530 Typical Potential Mitigation Measures, fourth bullet. Change to read "Conform to the most current edition of the City of Seattle Plans and Specifications for new utility construction.

4-530 Typical Potential Mitigation Measures, fifth bullet. Comment: Notification of outages will be done by SPU per City ordinance and will conform to existing guidelines, criteria and City of Seattle Standards.

4-531 Typical Potential Mitigation Measures, Eighth bullet. Comment - potholing may also be needed of other surrounding utilities to develop a utility relocation plan for a specific site.

4-531 Typical Potential Mitigation Measures, Tenth bullet. Comment - delivery inadvertent, all damage to any part of the SPU owned system will be repaired by SPU, not the contractor. If damage to SPU water facilities occur, contractor must call one call 206-386-1800, Contractor is not allowed to repair, modify, change, or operate any component of the SPU water system.

4-531 Typical Potential Mitigation Measures, Thirteenth bullet. Modify bullet to read "Specify protective measures, such as pipe and conduit support system, trench sheeting, vibration monitoring and protective shoring during construction to minimize or avoid potential damage to all utilities within the zone of influence."

4-531 Typical Potential Mitigation Measures, add bullet "design monorail foundations to allow for trenching next to column to access utilities without special considerations being taken by the affected utility."

4-531 Typical Potential Mitigation Measures, add bullet "Long range planning shall include mitigation for garbage pickup within the construction zones and detours"

4-531 Potential Mitigation Measures for Electrical Service, Water Supply, and Sanitary Sewer/Storm Drains add garbage service.

4-531 Potential Mitigation Measures for Electrical Service, Water Supply, and Sanitary Sewer/Storm Drains - fourth bullet. Comment depending upon soil conditions and/or construction activities, cast-iron lead-joint water mains may need to be replaced outside the 10' protection zone. The specific locations will be determined as more specific information becomes available.

4-531 Potential Mitigation Measures for Electrical Service, Water Supply, and Sanitary Sewer/Storm Drains - sixth bullet. Comment: This comment needs to be split because there are two issues at hand. First, SPU is responsible for water pressure and supply. The second issue is fire suppression and life safety, there may be other mitigation measure imposed by the fire department outside the water supply arena. This will require working with the fire department and private property owners to come up with mitigation measures to protect life safety. While the two are similar, they are two completely separate issues.

4-531 Potential Mitigation Measures for Electrical Service, Water Supply, and Sanitary Sewer/Storm Drains - seventh bullet. Modify to read "Comply with...(during construction), and the most current City of Seattle Standard Plans and specifications.

4-531 Typical Potential Mitigation Measures, Seventh bullet. Change to read " As a portion of long range planning, SMP will develop in coordination with SPU a general utility relocation and protection polices and procedures that is acceptable to the utility. Delete: "Seattle Utility Coordinating Committee and similar entities." The utility coordinating committee is in an advisory capacity only.

4-532 Potential Mitigation Measures for Electrical Service, Water Supply, and Sanitary Sewer/Storm Drains - eighth bullet. Comment - As part of long range planning SPU will determine water services affected by displacement of residences or businesses. Any modification of private property utilities must be coordinated by SMP with the property owners, as per City of Seattle Ordinance. In general, SPU water is responsible to the property line or the city union which may be far from the property line in some cases due to site specific complications like a rockeries or walls.

4-532 Potential Mitigation Measures for Electrical Service, Water Supply, and Sanitary Sewer/Storm Drains - ninth bullet. Comment - Under no circumstances is the contractor to damage, repair, modify or operate any portion of the water system including but not limited to water services, water mains, valves, test stations, and meters.

4-532 Potential Mitigation Measures for Electrical Service, Water Supply, and Sanitary Sewer/Storm Drains - tenth bullet. Comment - SMP does not have any role in the maintenance of water supply for emergency service purposes. If the water utility is damaged, the contractor must call the 24 hours emergency dispatch at 206-386-1800.

4-532 Potential Mitigation Measures for Electrical Service, Water Supply, and Sanitary Sewer/Storm Drains - eleventh bullet. Modify bullet to read "Engineer new water, sewer and storm system as appropriate and consistent with current City of Seattle Standard Plans and Specifications." . Where ductile iron pipe is to be installed for the water utility, soil conditions must be analyzed to determine if the pipe needs to be wrapped.

4-532 Potential Mitigation Measures - Develop agreements for least encumbering arrangement for maintenance involving digging near monorail foundations and guideways.

4-533 Text reports that "Use of the stadium facility and access to it would not be affected." but page 4-487 and 4-495 indicate otherwise by describing construction impacts. This inconsistency should be corrected.

4-533 Last paragraph: measures "normally required as conditions for permit approval" cannot be considered as mitigation.

4-533 Last paragraph. The text reads "erosion control and mitigation and revegetation". Use of the words "and mitigation" is unclear. The sentence should be clarified.

4-533 Last paragraph. The text reads "erosion control and mitigation and revegetation". Use of the words "and mitigation" is unclear. The sentence should be clarified.

4-542 In the downtown corridor, and historic preservation areas retention of existing granite curbs may be required.

4-542 The design for extension of sidewalk should incorporate existing decorative sidewalk design and must have the overview of the Seattle Design Commission.

4-543 "Additional mitigation measures that may be employed include modifying the drilling or construction technique, installing recharge wells, and adding support to adjacent structures." Installing recharge wells would not help in mitigating damage or settlement due to vibration from driving piles. However, installing recharge wells could help in mitigating affects from dewatering.

4-543 4.17.14.1 Impacts; Construction-Related Excavations. The document indicates that difficult excavations of well-consolidated geologic units may require blasting. No blasting will be allowed for excavation. Commonly available construction equipment will be able to excavate through the soil units associated with this project.

4-543 4.17.14.2 Mitigation. Third paragraph. This section indicates that vibration could be reduced by using vibratory pile drivers. However, damage threshold for steady state vibrations associated with vibratory hammers is less than for impact hammers. This difference in damage thresholds needs to be considered in developing mitigation plans.

4-543 4.17.14.1 Impacts; Construction period erosion. A reference of "Griswold, 2003" was cited. The reference is listed as personal communication with Dean Griswold. However, there have been no personal communications between SMP and Dean Griswold relating to this issue. The City of Seattle provided a written comment in review of PDEIS for the Monorail project. This reference should be removed.

4-558 A tree protection plan for trees that will remain in proximity to the guideway construction needs to be developed and implemented by a qualified, certified arborist. This is a standard requirement for all major construction projects that occur on Seattle Center grounds. Provisions should be written into construction contracts that penalize, monetarily, any construction firm that damages trees designated to be preserved and protected during construction. Designers and contractors must work with Seattle Center landscape and project management staff to enforce tree protection guidelines and to adapt construction objectives to minimize damage to trees growing in the construction zone.

4-558 All trees to be impacted by any route through Seattle Center should be appraised for their value before construction begins. The appraisal procedures should be those set up by the Council of Tree and Landscape Appraisers. This system is endorsed and utilized by the American Association of Nurserymen, American Society of Consulting Arborists, Association of Landscape Contractors of America, International Society of Arboriculture and the National Arborist Association. A consulting, certified arborist should be contracted to do this work. Based on values established by these appraisals, Seattle Center should be compensated for the loss of these trees and the cost of the appraisal work. The appraised value for a few trees impacted by the 3.1 route has been done for other projects on Seattle Center grounds. For example, the trees along the north and south sides of Republican St., between 3rd Ave and Memorial Stadium were appraised before the McCaw Hall project began. The appraised values range from $1300 for a Honey Locust to more than $10,000 for one of the larger London Plane trees.

4-558 Vibration and noise created by pile driving will impact fish in the ship canal. Mitigation measures such as air bubble curtains will be required during pile driving.

Appendix A - Environmental Justice

A-11 Concerning Indian tribes, the DEIS says "…No specific concerns have been raised so far...Typical areas of concern for tribes are potential impacts to water quality and fisheries. Impacts to these resources would most likely occur where the Green Line crosses the Ship Canal…." The only reference is to the Ship Canal. It should be stated that potential construction impacts related to environmental health, water, plants and animals may also occur in connection with the proposed Delridge location for the Green Line i.e. particularly disturbance of contaminated soils and release to ground or surface water. This may affect tribal fisheries at the mouth of Longfellow Creek, at the West Waterway of the Duwamish River at Terminal 5. (Documentation of the tribal fishery is through personal communication with George Blomberg, Port of Seattle.)

Appendix H – References

The document, "Phase I Environmental Site assessment, Proposed Open space, Longfellow Creek Natural Area, Seattle, WA," May 12, 1994 for the City of Seattle, prepared by GeoEngineers was given by SPU/Parks staff person Sheryl Shapiro to Parametrix and Monorail staff for review concerning environmental health and water issues. This report discusses the research and findings of parcels adjacent to the proposed Delridge alignment and stations. It is not listed in the reference section nor cited in the Chapters on these areas. Of particular note are pages 16

and 17 that state "...it is our opinion that the site has residual concentrations of regulated substances in concentrations exceeding MTCA cleanup levels." We recommend taking a close look at this document to see if it has information that should be further analyzed and incorporated into the EIS. Copies are available.

Appendix I - Projects to Consider for Cumulative Impact Analysis

I-1 The AWVSRP draft EIS, due out in March 2004, will describe five alternatives as well as a no action alternative. Construction schedules assume major work to begin in 2008, although funding has not been confirmed. We recommend that you modify the description of the AWVSRP in this section of your EIS in two details. First, the parenthetical at line 12 of the paragraph should read, "combinations of at-grade, aerial and tunnel routes." Second, the sentence beginning, "Plans for…" in line 14 should be replaced with, "Plans for the project currently include refitting the Battery Street Tunnel for fire and life safety improvements, which together with reconstruction of the AWV will require use of detours on Downtown Seattle surface streets. Depending on the alternative selected, Broad Street and Alaskan Way will see the heaviest impacts."

The Alaska Way Viaduct and Seawall Project (AWVSRP) plans to include work on Aurora Avenue North (SR 99) and some adjacent streets in the segment from Denny Way to Roy Street. Some features of the different options currently under consideration are as follows:

<u>Widened Mercer</u>
- Thomas Street would be reconnected with an overpass over Aurora and improved as far west as 5th Avenue North.
- Mercer Street as far west as 5th Avenue North would be restored to two directions and expanded to a total of seven lanes.
- Broad Street would be abolished and backfilled from Thomas Street to Dexter Avenue North.

<u>Lowered Aurora</u>
- Aurora would be lowered from John Street to Ward Street.
- Thomas, Harrison, Republican and Roy Streets would be reconnected with overpasses over Aurora.
- Mercer would be widened, restored to two directions and routed on an overpass over Aurora.
- Broad would be abolished and backfilled from Thomas to Dexter.

<u>Existing Mercer Underpass</u>
- Thomas would be reconnected with an overpass over Aurora and the south side of the intersection with 5th Avenue would be improved.
- Broad Street would be abolished and backfilled from Thomas to Dexter.
- Traffic signals would be installed along Aurora at crossings with Thomas, Harrison, Republican and Roy Streets.

The western construction limit for all of these options is the east side of 5th Avenue. This would be adjacent to a monorail guideway running in the middle of 5th Avenue. It would overlap guideway and stations on the east of 5th from Mercer to Thomas. The potential Vine Street pocket track lies in this general vicinity, too. These interferences do not necessarily invalidate any Green Line alternatives, but the plans of the two projects should be coordinated here in detail. Furthermore, current schedules contemplate AWVSRP construction to take place in this area as early as 2008 and 2009, which overlaps with the Green Line construction window of 2005-2009. Simultaneous construction activities might impact each other and accumulate impacts in the neighborhood and surrounding streets. (Also see 3-30 to 3-33.)

The DEIS states that in SODO the Green Line would run along South Horton Street to cross the Burlington Northern Santa Fe (BNSF) tracks and SR 99. Spokane Street is the southern limit of alternatives currently under consideration for the AWVSRP. No changes are under consideration for the AWV itself in the vicinity of Horton, but there are potential changes to the rail crossings. One of the options under consideration by the AWVSRP involves relocating the Burlington Northern Santa Fe SIG rail yard to the south. This shift would increase the number of places rail tracks cross South Horton Street between First Avenue South and East Marginal Way. Plans for the Green Line structure (e.g. pier locations) along Horton Street should take this possibility into account. (Also see 3-38 and 3-85)

Parking impacts of the AWVSRP vary among alternatives under consideration. In City neighborhoods ranging from the Stadiums to the North Waterfront, the AWVSRP could permanently eliminate totals of up to 1000 on-street and 120 off-street parking spaces. During major AWVSRP construction (currently projected for 2008-2015), the total temporary loss could be up to 2400 spaces, though this may be mitigated by shuttle arrangements from existing out-of-area parking or by construction of new parking structures by the AWVSRP or by private interests. (Also see 4-61 and 4-464.)

The 2005-2009 timeframe planned for the Monorail Green Line overlaps the 2008-2015 major construction period contemplated for the AWVSRP. Each project will be phased, and each is susceptible to delays. It is possible that Green Line construction will be complete before AWVSRP work begins. Nevertheless, the two project teams must coordinate in order to minimize potential interferences and overlaps between their activities and impacts, particularly along 5th Avenue North on the east side of Seattle Center and in downtown. (Also see 4-470)

During the time that segments of the AWV and Battery Street Tunnel are being reconstructed, SR 99 traffic will be rerouted. A leading option would send two lanes of southbound SR 99 traffic west on Broad Street (the closure of Broad Street described above would happen afterwards) to a temporary overpass connecting with Alaska Way for a period of some seven years, currently to start in 2008. Furthermore, temporary closure of the AWV ramps at Western and Elliott Streets might require northbound AWV traffic destined for Belltown, Magnolia and Interbay to remain on SR 99 through the Battery Street Tunnel before exiting and continuing to these destinations on surface streets. Both temporary and permanent impacts to traffic in the area of Seattle Center from the Monorail Green Line need to be coordinated with those of the AWVSRP. (Also see 4-60 and 4-485.)

AWVSRP diversions and delays will tend to increase traffic on parallel downtown arteries, to include 2nd Avenue, where the Green Line construction and alignment is planned. (Also see 4-485.)

Planning for the AWVSRP commits to maintaining at least two lanes each way on SR 99 and at least one way each way on Alaskan Way through the duration of construction, but detours and narrowing could degrade their usefulness as construction access routes for the Green Line project. (Also see 4-486.)

I-2 Viaduct discussion related to Aurora should be changed from "reconnect the street grid system over Aurora Avenue in the Seattle Center area." to "connect some streets across Aurora Avenue in the Seattle Center area, including a widened, two-way Mercer Street between Dexter and Fifth Avenue North."

I-2 Concerning the I-90 Two-Way Transit and HOV Operations Project, funding has only been identified through final design. Some construction funding has been identified, but there's still potentially a $60-100 million shortfall.

I-5 City of Seattle: South Lake Union Improvements - add a new sentence after the sentence re Mercer Street (the first sentence below) "The City is considering a widened, two-way Mercer Street as the major connector between I-5 and Aurora Avenue and a narrower, two-way Valley Street that provides a pedestrian-friendly environment along the south edge of South Lake Union Park. {new sentence --->} With changes under consideration for the Alaskan Way Viaduct Replacement Project, the two-way Mercer Street would extend west to Fifth Avenue North." In addition to a two-way Mercer option, improvements to the existing Mercer - Valley couplet will also be examined in an upcoming EIS. The Design and Environmental Review is expected to occur in 2004 and 2005.

I-5 Under City of Seattle: South Lake Union Improvements,
A street car route is being planned along Westlake Avenue and Valley Street between South Lake Union and Downtown Seattle. ADD: "Pending funding, design would start in 2004, with construction in 2005. Design and environmental review will take place in 2003 and 2004.

I-25 Under Seattle Center/QA stations, 3rd paragraph. The Residential (restricted) parking zone in this area should be referenced. The RPZ zone lies northeast of the Seattle Center between Roy St, 5th Ave N, W Aloha St and 1st Ave W--including operating in the evening.

I-25 Last sentence. New parking meters are being installed in areas with time-limit signs now or in unrestricted areas, not where there is no parking allowed now.

I-40 Referring to Safeco Field parking, it should be noted that this parking study was not done on a typical game-day (February 13th). More information from the parking studies from Seahawk Stadium or Safeco Field could be cited to explain what happens with on-street parking during game days.

I-49 "The restricted parking supply is mostly signed, two- or four-hour parking. The restricted zoned parking in this segment limits parking to four hour between 9:00 a.m. and 6:00 p.m." This point would read better if it were combined, such as "the restricted parking supply is mostly signed, two- or four-hour parking between 9:00 a.m. and 6:00 p.m."

Appendix J - Acronyms

J-3 Add OED (City of Seattle, Office of Economic Development)

Appendix K – Glossary

K-7, K8 Add specific Code citations for SEPA view references; for urban center and urban village definitions, refer reader to specific sections and pages of City Comprehensive Plan and Countywide Planning Policies.

Appendix L - Conceptual Design Drawings, EIS Footprint Plans, Draft Cross Sections

Drawing L01-00-01 The double crossover south of Crown Hill station 1 should be moved south or north of the intersection of N 82nd Street in order to minimize shade/shadow impacts at the intersection and cross street.

Drawing L01-10-01 Same comment as for L01-00-01 relative to Crown Hill station 2 - moving the crossover south of N 82nd Street.

L03-00-02, L06-00-04, L03-10-02, L3-10-03, L05-10-03 North arrow is missing on figure.

L-165-166 Interbay Station cross-section: What does the 10.5' combined planter/sidewalk refer to? How wide is the sidewalk? How wide is the planting strip?

L170 - L181 There should be a cross sections showing straddle bents on Mercer.

Drawing EIS-4B-01 Why does the 2nd Avenue Center alignment require cutting across the Bon parking garage site whereas the 2nd Avenue East alignment does not?
multiple Drawing shows storage tracks near John station on Alt 3.1, (page 18) but where are storage tracks for Mercer route, 3.2 (page 53) or Thomas, 3.3 or Denny 3.5 (page 84-88).

Appendix M – Visual Simulations

Figure M-10b The nighttime simulation of the monorail trains shows a headlight beam. If the final design incorporates such lighting, light and glare impacts on adjacent uses must be identified.

Figure M-22 The FEIS should discuss portion of the alignment between West Harrison Street and West Prospect Street in relation to the Elliott Avenue to Puget Sound view corridors as defined in the Seattle Municipal Code section 23.50.026. C.3.

Figure M-34 Alternative 3.1 shows an existing amusement ride with the monorail superimposed over (or through) it. It should be noted on the figure that the existing ride would need to be removed due to its height, with a new ride likely put in its place compatible with the new columns.

Figure M-93 This image is not sufficient to capture the impacts of the monorail on the West Seattle Bridge. The West Seattle Bridge is a SEPA scenic route (25.05.6 80). The visual impacts of the columns and guideway from the bridge should be simulated.

Figure M-100 With respect to visual impacts, the most sensitive area in proximity to Delridge 2 is Longfellow Creek Greenspace. Despite this, the visual simulation shows the station from a direction where the Greenspace is not visible. A new simulation should be developed looking east along SW Andover from a position west of the creek.

Figure M-101 Visual simulation for Avalon 2 shows existing trees that, according to project description, would be removed. The simulation should be corrected to show the station without trees.

Figure M-101 Typically, visual simulations are described as being conservatively large. The Avalon station is known to be approximately 65 feet high. Comparison to adjacent 60-foot tall trees inventoried in Appendix W (page W-10) indicates the simulation shows station to be considerably shorter than 65 feet. Furthermore, based on an informal analysis of perspective construction and the known height of a parking sign in the photograph, the visual simulation shows the building to be no more than 50 feet high. The visual simulation should be corrected to reflect the station massing, insofar as it is known.

Figure M-101 The visual simulation shows no shade impacts. The station will cast a shadow across 35th Ave SW in the am and into West Seattle Stadium athletic fields in the pm. These conditions should be illustrated with a visual simulation.

Cultural Resources - Appendix N

Construction monitoring in additional locations beyond those categorized as "high probability" is recommended. A randomly chosen, statistically defensible sample of those areas with a lesser probability of bearing significant historic or prehistoric deposits (but still viable, based on local depositional history), would allow for both resource protection and future methodological assessment. Sub-surface resources warrant added vigilance based on their extreme vulnerability during construction and the difficulties in planning and protection for this resource type. Where significant intact deposits are preserved, massive impacts to the record due to urbanization make them quite rare. Given the current plan where only high probability areas are monitored (i.e. provided only the minimum level of protection), if resources are found and data recovered, they will add to what we know in areas where some historic or documented information is probably already available. If significant resources come to light in other areas impacted by the Monorail Project, new information will be gained for less well documented land use, and the predictions possible for future work will be further refined. Practice has shown that isolated findings of certain types can be highly significant, and significant findings are frequently encountered in unexpected places.

The following properties determined eligible or listed on the NRHP are not included in table N-3. No reason is given for their exclusion. These properties should be included. B-60, 132, 140. I-25, 26, 52, 66, 72, 73, 1C, 19. SC-8, 13, 16, 22, 31, 32. D-2, 5, 10, 26, 27, 37, 33, 36, 38, 42, 43, 46, 47, 49, 51, 54, 57, 59, 64, 66, 67, 72, 73, 74, 75, 76, 79, 80, 85, 89, 90, 91, 93, 96, 97, 98, 100, 101, 105, 109, 110, 114, 117, 119, 121, 122, 123, 124, 127. S-26. WS-14, 97, 143, 148, 81. These properties should also be included on table 4.17-6. According to the second paragraph under Historical Resources on page 4-534 section 4.17.12.1 Impacts, all of the above resources should be included. Also the term "sensitivity" has no supportive documentation or relevance within the report. "Sensitivity" should be replaced with "Fragile" and "Very Sensitive" with "Extremely Fragile," which are terms documented within the body of the DEIS and relevant to the material discussion. Otherwise, the source of these terms should be referenced and their definitions provided.

N-3 Last paragraph: During follow up sessions, no concurrence was given or review conducted to determine eligibility for City of Seattle Landmark listing of properties that were not to be demolished. This should be clarified.

N-8 Historical Resources heading: The Green Line "would" have an impact and an adverse effect on more than one historical resource. Need to clarify this. Current statement reads only one property would be affected. The first paragraph under "Historic Resources" lists no properties as having an adverse effect from the project. This appears at odds with the findings of the Historical Resources Technical Report later in the Appendix.

N-134 First sentence of last paragraph is not a complete sentence.

N-161 Under Ballard Segment, 2nd paragraph, 2nd line: Delete phrase "of Historic Places" - redundant.

N-162 Under Downtown Segment: Revise to use correct terminology for the Pike Place Market Historical District (local) or Pike Place Public Market District (NRHP). Also correct the local/NRHP boundary discussion as noted above.

N-173 Table N-1: D-127 is eligible - see 8/7/03 letter from Allyson Brooks.

Appendix Q - Displacement & Relocation Backup Information

The property listed as the Forest Hotel - Plasma Center at 1521 2nd Ave. should be identified as the Green Tortoise Hostel.

The property listed as a residence at 3036 16th Ave. W. should be identified as the Interbay Animal Hospital.

The section on Potential Parcels Affected by Construction Staging does not identify what the uses of the properties are, as is done in the other sections of Appendix Q.

Q-4 This table does not provide specific information as to which parcels will be affected by a particular route, only those in the vicinity of the route. Additionally, it is not always accurate. For example, Pacific Science Center is listed under Alt 3.1, where it should not be, but not under 3.5, where it should be. How does SMP arrive at the numbers quoted in the DEIS from these tables. There should be an indication by each parcel as to whether a property acquisition would be required, and if so, if it is full or partial.

Appendix R - Noise & Vibration Backup Information

No backup information was provided in Appendix R for the vibration analysis and impact assessment.

Appendix R should provide a risk analysis methodology supporting the claims of "conservative" or "worst case" analysis and conclusions contained in Section 4.7 of volume 1.

R-1-6 The methodology for noise energy increase and decrease for modeling should be clarified.

Appendix S - Environmental Health Backup Information

Figure S-3 identifies a site, number 203 at 4th and Harrison (EMP turnaround) on the map of Documented EDR Release Database Sites, but does not mention it in the corresponding table on page S-5.

This section is confusing with respect to the health based guidelines, what they cover, and how they relate to the Monorail. Given scientific attention on AC magnetic fields, and concern about interference with pacemakers and implanted medical devices, the DEIS would be improved by including MBTA data on measurements of AC magnetic fields that are mentioned.

The conclusion that: "SMP will analyze the Green Line system in its built environment and will project magnetic field intensities, comparing results to applicable standards to ensure the safety of the public and monorail personnel" is vague. While accessible data on static and AC electric and magnetic fields from comparable transportation systems may be limited, some projections using assumptions about selection of system components is possible in the DEIS if insufficient information is available.

Looking specifically at how exposure to various components of the system could affect persons who rely on implanted medical devices appears warranted.

Mitigation: "Once a system is chosen, electric and magnetic field intensities will be confirmed and compliance with applicable standards will be ensured". Compliance with "applicable standards" is vague. Guidelines established by ACGIH and ICNIRP amount to recommendations. What standards will be selected? What steps will be taken to adopt standards and how will compliance be determined?

In lieu of analysis in the DEIS that reasonably demonstrates compliance with health based guidelines, a more specific statement on mitigation of possible impacts is needed. We suggest the DEIS state the DBOM contract will contain provisions requiring the contractor to demonstrate that all parts of the system comply with standards for exposure to electric and magnetic fields incorporated as specifications in the contract. The ETC would determine what those standards are based on existing guidelines.

S-1 "The primary electric and magnetic fields produced by direct current (DC) are static or stationary. Most standards for comparison of magnetic fields apply to alternating current (AC) sources of power, since frequency (measured in cycles per second or hertz (Hz) is related to magnetic field intensity (measured in gauss units (G)). However, DC-powered trains have equipment that produces alternating current (AC) fields (NIEHS June 2002)." This paragraph suggests a focus on alternating current magnetic fields, however most standards apply to direct current (DC) static magnetic and electric fields as well. ACGIH and ICNIRP guidelines cited in the DEIS have both published occupational exposure guidelines for static magnetic and static electric fields.

The guidelines and their components are complicated. The text needs to include enough information to be clear on: frequency range, whether occupational, public, and/or special population (pacemaker wearers) exposures are covered, and whether the guideline applies to both AC and DC electric and magnetic fields.

S-1 "The train control and communications systems would produce electric and magnetic fields and interference similar to radios." This statement seems out of place in the human health section except as it pertains to pacemakers and other implanted devices.

S-1 " Measurements taken along this system concluded that average static magnetic field intensities at coach seats range from 500 to 1,000 milligauss with maximum levels reaching 1,000 to 3,000 milligauss. Alternating current frequencies within the system exhibited lower magnetic field intensities." What were the AC magnetic field intensities? The ACGIH guideline for AC magnetic fields is one fifth of the guideline for static magnetic fields.

S-1 "Electric field intensities in similar situations were less than 10 percent of the ACGIH pacemaker exposure limit and approximately 1 percent of the ICNIRP guidelines for public exposure." In what situations? It is not clear whether the comparison being drawn applies to persons along the route or persons in the coach.

S-2 "Rail transportation equipment is capable of producing electric and magnetic fields at intensities high enough to affect some models of pacemakers and defibrillators. ACGIH guidelines recommend that workers with cardiac pacemakers not expose themselves to 60-Hz magnetic fields exceeding 1,000 milligauss or 60-Hz electric fields exceeding 1,000 V/m (Volts per meter)." Insert clarification "…AC 60-Hz magnetic fields…". Also, the ACGIH guidelines apply to static magnetic fields, recommending that 0.5 mT (5,000 milligauss) not be exceeded for pacemaker wearers.

S-2 "SMP will analyze the Green Line system in its built environment and will project magnetic field intensities, comparing results to applicable standards to ensure the safety of the public and monorail personnel." A description of the analysis that remains to be conducted is needed in the context of current guidelines. For example, will the Green Line be evaluated to determine if pacemaker wearers may be exposed to fields that would exceed ACGIH guidelines? What specific questions will be addressed in the analysis?

S-2 "DC is primarily a source of electric fields; magnetic fields from DC power sources are considered "minor". Minor in what sense? Measurements of static magnetic fields taken on MTBA coaches and contained in the DEIS are 500-1,000 mG average at the seats and 1,000 - 3,000 mG maximum.

Appendix U - Land Use Backup Information

U-1 When the Monorail is stated to be consistent with the multi-modal transportation system set forth in the CWPPs, at FW-18, please specify which part of the CWPPs.

U-1 It is unclear whether the SMP is saying that the Monorail project will service the growth contemplated by the Urban Village strategy after that growth occurs or if it is saying that the Monorail will promote and encourage development. If the latter, specific how. When the Monorail is stated to be "also consistent with the adopted land use plan of Seattle because it directs service to urban villages and to the Downtown urban core", please state which policies of the land use element of the Comp Plan this statement references. LG5 and L1 refer to promoting mixed-use development and encouraging that development in urban centers and villages. See also, comment on page U-4.

U-2 The statement is made that "it is important to examine the broad intent of a plan in determining neighborhood character as well as specific policies and regulations." However, on page 4-156, it is stated that development regulations are not being reviewed in this EIS. The development regulations should be reviewed in the EIS as called for in the City's SEPA Ordinance.

U-4 Second to last paragraph: The statement is made that a key component of the urban villages' strategy is to provide a coordinated transit system connecting urban villages. Please identify the specific land use or transportation policies that identify this as a key strategy. T11 is specifically cited, but it is not clear how the Green Line helps areas reach growth targets.

U-8 With respect to the statement that the Green Line is consistent with TG8, TG9 and T20 ("preserving the City's street capacity for other uses"), the next sentence states that the Monorail will cause some loss of on-street parking or lane capacity, both of which are key functions of the City's street capacity.

U-10 With reference to B1-P15, how will the placement of the Green Line in the right of way affect turning radii, visibility and sightlines and existing lane configuration?

U-10 With reference to CH/B-P9, how will the Green Line improve the contribution of 15th Avenue NW to the visual character of Crown Hill and Ballard?

U-11 Delridge: The statement is made that the station alternatives should "help further the goal of pedestrian-oriented development." Please explain specifically how this will be achieved.

U-12 First paragraph beneath policy DT-TP8 - states that "some public views along east-west streets could be affected uphill from Second Avenue…" In this case, "could" should clearly be "would" since views are affected.

U-12 First full paragraph. Statement: "Where financially feasible, the stations located largely outside the street right-of-way could have the least impact to the pedestrian environment." It is unclear whether or not this is a mitigation commitment.

U-15 Statement re: "The Green Line would assist with general access and mobility. GD-G9, GD-P21." However, these goals presumably refer to general freight access and mobility - see, for instance, GD-G12: "The transportation network in the Duwamish emphasizes the mobility of freight and goods." How does the Monorail assist with freight mobility?

U-15 Morgan Junction - statement concerning other buildings in the area being of similar height - see general comment in the Land Use section about quantifying the number of buildings to indicate whether there are a majority or even a significant minority of buildings in the area at the height of the proposed station structure.

U-16 The statement concerning alternatives further to the south "would not provide as strong a link or as great a change" - please clarify what type of change this references.

U-16 Statement that the "Green Line would promote policies promoting urban transit solutions", citing Policy QA-P33, mischaracterizes the policy, which calls for the transportation facilities and services to be consistent with Queen Anne's unique urban character, not for 'urban transit solutions.' Please provide analysis showing how the Monorail is consistent with Queen Anne's unique urban character.

U-16 West Seattle Junction: How would the Green Line assist with the goal of higher-density mixed use development at the Junction?

U-19 Typically, DCLU does not apply development standards to structures in the right-of-way

U-20 LG94: This policy is related to transportation networks and is not related to "visual" access to the shoreline. The Monorail does not provide physical access to the shoreline.

U22 and U23 No discussion or analysis of the Mercer Theater District Plan is provided.

U23 The statement "None of the Green Line alternatives would adversely affect the ability of the Seattle Center to carry out the Seattle Center Master Plan because the projects envisioned in the plan are now largely complete." is incorrect, as the Seattle Center Theatre District is part of the 2000 update, and has only completed the schematic design phase.

Appendix W - Tree Survey Backup Information

The information on trees in Seattle Center for Alternative 1 or 3 is incomplete. No data is present for height range, nor DBH range.

The basis for determining the number of trees "affected" is not provided; the basis should be provided. The survey needs to provide detail should on which trees are to be removed and which ones are to be trimmed.

W-3 East side of First Avenue North, south of Republican, behind Olympic Room -other trees include 4 Acer circinatum, 1 Catalpa bignoniodes, London Planes are in pits.
Upper Northwest Rooms courtyard - Sweetgums are 25-35 ft., in tree pits
Key Arena, northwest corner - Jacquemontii Birch, 15-20 ft., quantity = 9 in planter bed
Key Arena, northwest corner - Amelanchier laevis, 20-25 ft., quantity = 13 in planter bed
Key Arena, northwest corner - Pinus contorta, 15-20 ft., quantity = 9 in planter beds
Republican St. south side, between Warren and Second Ave. - London Plane height = 40'-50', in planter, other trees include 3 Acer circinatum, 1 Acer davidii, 1 Sorbus hupehensis, 1 Acer palmatum.

W-4 Republican St. north side, between Warren and Second Ave. - other trees include Quercus rubra, 30-40 ft. quantity = 1 in planter bed

Republican Street, south side, between Second Ave and Third Ave. - other trees include Fagus sylvaticus 'pendula', 30-40ft, quantity = 1 in planter bed, Robinia, psudoacacia, 40-50', quantity = 1 in lawn, 1 Abies koreana, 15-20', quantity = 1 in planter bed, Gleditsia triacanthos, 25-30', quantity = 1 in tree pit.

School district property: Memorial stadium tree border - there are dozens of additional trees and many more species in this area that are not reflected on the inventory, and that will likely be impacted by construction of 3.1 option

West side of EMP - these trees are Hornbeams (Carpinus betulus)

East side of Warren Ave. Republican to Mercer - London Plane trees are in the planter beds, not tree pits

W-6 In is unclear if the trees in the Segment called "Longfellow Creek Greenspace" are within the Yancy Street ROW or part of Parks department property called "Longfellow Creek Greenspace".

W-6 Segment beginning "SW Yancy Street..." is incorrect; no "lawn, by gym" in this segment.

W-8 North side of Mercer St. - between Second Ave. and Third Ave. - Not a Blue Spruce, but rather a Cedrus atlantica.

W-10 The quantity of trees (18-23) listed as impacted for Segments "35th Ave SW from SW Avalon…" and "35th Ave SW from SW Oregon…" is significantly under counted. Conservative estimate would be 45 trees over 40 feet.

Gregory J. Nickels
Mayor of Seattle

September 16, 2003

Joel Horn
Executive Director
Seattle Monorail Project
1904 Third Avenue, Suite 105
Seattle, WA 98101

Dear Mr. Horn:

The City of Seattle has begun its review of the Seattle Monorail Project (SMP) Green Line Draft Environmental Impact Statement (DEIS). In advance of the City's comprehensive comments on the DEIS, I would like to make you aware of my concerns regarding your agency's interpretation of City policy intent toward the project.

I am committed to helping the SMP achieve its goals of completing the Green Line on time and under budget, while helping you to find the best fit for the monorail within our transportation system and our neighborhoods. This commitment is also expressed in a City resolution (Resolution 30486), which you have cited in the Green Line DEIS discussion of mitigation measures. In my view, the DEIS misinterprets the City's policy intent as suggesting that mitigation requirements will be defined very narrowly to support budget and schedule objectives. Notably, the DEIS states that the SMP will be responsible only for improvements "immediately adjacent to stations."

The environmental review process provides an opportunity to identify those elements of the project scope and design that are necessary to successfully integrate the monorail into its environment. SMP's responsibilities cannot be determined merely by adjacency to stations or other monorail facilities, but must consider a broader zone of influence of those facilities within the legal framework provided by the State Environmental Policy Act (SEPA).

The City and SMP have already begun a process of working cooperatively to identify the zone of influence of the Green Line. The City's comments on the DEIS, approval of intergovernmental agreements granting the use of City property and right-of-way for monorail facilities, advisory review by the Monorail Review Panel and Pioneer Square Preservation Board, and administrative permitting are each part of the process of identifying this zone of influence and integrating the monorail into the city. It is already apparent that the zone of influence includes neighborhood parking within one-quarter mile of stations and streetscape improvements where the street environment is impacted by the

monorail guideway and stations. These are the kinds of project elements that I believe should be included in the project description and mitigation measures, and which I will otherwise recommend as conditions of approval of right-of-way and property agreements.

I am confident that the goals of project cost containment and a well-integrated transportation infrastructure can be achieved simultaneously. I hope this clarification of City policy intent, as well as the more detailed DEIS comments that will follow, are helpful to SMP as you continue to refine the balancing of these objectives.

Sincerely,

GREG NICKELS
Mayor of Seattle